BULLETIN OF THE

TAYLOR SOCIETY

AN INTERNATIONAL SOCIETY TO PROMOTE THE SCIENCE
AND THE ART OF ADMINISTRATION AND OF MANAGEMENT

Scientific Management in a Textile Business

Scientific Management in Manufacturers' Marketing

Manufacturers' Marketing Survey

Standards

Master Planks in the American Industrial Platform

Engineering Societies Building
29 W. Thirty-Ninth St.
New York

DECEMBER, 1927 VOL. XII, NO. 6

Objects of the Taylor Society Incorporated

The objects of this Society are, through research, discussion, publication and other appropriate means:

1. To secure—for the common benefit of the community, the worker, the manager and the employer—understanding and intelligent direction of the principles of administration and management which govern organized effort for accomplishing industrial and other social purposes.

2. To secure the gradual elimination of unnecessary effort and of unduly burdensome toil in the accomplishment of the work of the world.

3. To promote the scientific study and teaching of the principles governing organized effort, and of the mechanisms of their adaptation and application under varying and changing conditions.

4. To promote general recognition of the fact that the evaluation and application of these principles and mechanisms are the mutual concern of the community, the worker, the manager and the employer.

5. To inspire in labor, manager and employer a constant adherence to the highest ethical conception of their individual and collective responsibility.

Membership

The membership of the Society comprises Members, Junior Members, Honorary Members, Life Members, Firm Members, Contributing Members and Student Associates. Application for membership should be made on a regular form which may be secured from the Society. New members may be elected directly to the grades marked*.

1. **Member*: An individual interested in the development of the science and the art of management as engineer, executive, operative, scientist, investigator or teacher. Minimum age 28. Initiation Fee, $15. Annual dues including subscription to the Bulletin, $20.

2. **Junior Member*: A younger member. A Junior Member may become a Member without payment of additional initiation fee at 28 years of age and must change to Member at 30 years. Initiation Fee, $5. Annual dues including subscription to the Bulletin, $10.

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3. *Honorary Member*: A Fellow, over 50 years of age, who has rendered exceptionally distinguished service in the advancement of the science and the art of management.

4. **Life Member*: Any Fellow or Member who has prepaid all dues by the payment of $500.

5. **Firm Member*: A firm or organization interested in the advancement of the science and the art of management which desires to make the service of the Society available to members of its organization. A firm member designates two representatives (who may be changed from time to time at the organization's discretion) who have all the rights and privileges of membership except the right to vote and to hold office. Annual dues, including two subscriptions to the Bulletin, $40.

6. **Contributing Member*: Any individual, firm or organization desiring to promote the work of the Society by an annual contribution of $100 or more. A contributing member has all the privileges of personal or firm membership, as the case may be, including one subscription to the Bulletin for each $20 contributed.

7. **Student Associate*: A regularly enrolled student of management in any school of engineering, business administration, commerce or arts, of collegiate rank, or a graduate of such institution who has applied for membership not later than one year after graduation, elected upon recommendation of the instructor in charge of management courses. A Student Associate may become a Junior Member, without payment of initiation fee, any time after graduation and must become a Junior Member at the age of 25. Annual dues including subscription to the Bulletin, $3.

All dues are payable in advance, either annually or in semi-annual installments. The fiscal year is November 1 to October 31. Members elected other than at the beginning of the fiscal year are charged pro rata (quarterly) for the first year.

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The Spring Meeting

The spring meeting of the Society will be held in Detroit early in May and will be devoted to the subject of time study. A single session did not prove adequate for discussion of Mr. Sanford Thompson's excellent paper on that subject at the December meeting. The suggestion that all of the spring meeting sessions be devoted to a searching discussion of time study was received with unmistakable favor by the members who were present.

Comment

THE papers and discussions of the December meeting, of which only a part could be included in this issue of the BULLETIN, were generally of an exceptional quality. No executive can afford to be too busy to give them the attention which they merit.

MR LEWIS' platform for American industry is a challenge. Able discussors did not discover essential weakness in it as a platform—a statement of objectives. Discussion centered about the uncertainty of our knowledge of fundamental forces which condition industrial development.

MR. KENDALL'S description of the all-round development of scientific management in a textile business is a significant document. "Here is convincing evidence," said one of the discussors, "that scientific management is not a system which is bought and installed. It is a mental attitude, a group of relationships and a system of procedures which are the fruition of years of educational leadership; a leadership informed concerning technique, rich in imagination, wise in adaptation, social in its objectives, and both energetic and patient in showing the way."

MR. DENNISON'S paper on merchandising and selling, and the report on the questionnaire concerning manufacturers' marketing, are likewise significant documents. The author has been a pioneer in the development of the merchandising concept—the concept of a unit which is the co-ordinator of sales and production activities. What is perhaps astonishing, is the extent to which the questionnaire indicates recognition of this merchandising function as defined by Mr. Dennison. Of the concerns reporting—a selected group, to be sure—sixty-three per cent claim to recognize it in organization structure, and eight per cent of the remainder claim to recognize it in practice. Without doubt these figures should be discounted somewhat; nevertheless, they indicate that marketing methods have truly progressed during the past eight years.

The James Mapes Dodge Fellowship

in Scientific Management

THROUGH the courtesy of Mrs. James Mapes Dodge, of Philadelphia, the Taylor Society is privileged to announce a fellowship in scientific management established in memory of her husband, James Mapes Dodge, first president of the Taylor Society.

This fellowship is a timely service to education. One of the difficult problems faced by schools of engineering and business administration is to find instructors in management whose formal training has been supplemented by experience which gives a sense of the real nature of the factors involved in management, and contacts which develop perspective and a sense of values. Details of the fellowship are as follows:

The stipend is $1500 per year, the tenure two years and tenure begins September 1, 1928.

The fellowship is available to graduates of engineering schools, schools of business administration, commerce and finance, of all schools and departments of university and college rank in which management is an important subject of instruction.

In making the appointment to this Fellowship the following qualifications of an applicant will be given special consideration:

Personality, capacity for leadership and scholarship;

The extent to which management has been made a subject of special study;

The intent to make the teaching of management a career;

Experience and success in teaching, especially in the field of management;

In the absence of teaching experience, the fact that the applicant has been offered and has accepted a specific appointment for the teaching of management after he shall have made such preparation as is offered by this Fellowship.

A Fellow who has been appointed for the two years tenure will apportion that period as follows:

Four months of autonomous study of scientific management in the library of the Taylor Society, Engineering Societies Library and other libraries in New York, under the direction of H. S. Person, Managing Director of the Taylor Society (formerly Director and Professor of Organization and Management, The Amos Tuck School, Dartmouth College); this study will also involve special conferences arranged by the Taylor Society with engineers engaged in management development service;

One year of work in a scientific management plant;

Five months of travel and inspection of other plants;

Three months of additional autonomous study and writing of a thesis in the library of the Taylor Society, under the direction of H. S. Person, Managing Director.

James Mapes Dodge was born in Waverley, N. J., June 30, 1850, and died in Philadelphia, December 4, 1915. He was educated at Cornell University and Rutgers College. The years immediately following were spent in iron works and shipbuilding plants. In 1876 he associated himself with William D. Ewart, inventor of the Ewart link, and became a pioneer in the application of chains to power transmission.

Out of this association grew the Link Belt Engineering Company and the Dodge Coal Storage Company, of both of which Mr. Dodge was the first president. These companies were consolidated in 1906 as the Link-Belt Company, with Mr. Dodge Chairman of the Board.

Mr. Dodge was a close friend of Frederick W. Taylor and shared with Wilfred Lewis, of the Tabor Manufacturing Company, the distinction of being one of the first two managers to adopt and develop scientific management in their plants.

He made many contributions to the literature of management, and emphasized continually the concern of scientific management for the welfare of the workers. His concern for the interests of the workers in his own plant was conspicuous. His paper on the spirit in which scientific management should be approached, presented at the Tuck School Conference in 1911, was an evidence of his strong sense of human values.

Mr. Dodge became president of the American Society of Mechanical Engineers in 1903, and of the Taylor Society in 1911. He was recipient of the honorary degree Sc.D. from Stevens Institute.

The trustees of the Fellowship are George D. Babcock, Manufacturing Research, Dodge Brothers, Inc., Detroit, Mich., Vice-President of Taylor Society; William Crozier, Major General, U. S. A., Retired, Washington, D. C.; Henry S. Dennison, President, Dennison Manufacturing Company, Framingham, Mass., Past-President of Taylor Society; John R. Freeman, Consulting Engineer, Providence, R. I., Past-President of American Society of Civil Engineers and Past-President of American Society of Mechanical Engineers; Morris E. Leeds, President, The Leeds & Northrup Company, Philadelphia, Pa.

Detail information and application forms will be available February 1. Address inquiries to the Taylor Society, 29 W. 39th St., New York.

Scientific Management in a Textile Business[1]

Operating a number of plants in different localities which are managed as a horizontally and vertically integrated group carrying the material from the cotton bale to the ultimate consumer, and which involve both continuous and intermittent processing

By HENRY P. KENDALL[2]
Treasurer, Kendall Mills Inc., Boston

I. Introduction

1. Kendall Mills Inc. is a corporation of which the business is the manufacture and sale of what may be called coarse cotton cloths, of four classes from the point of view of consumer use: (1) hospital gauze, bandages and surgical dressings; (2) white and colored cheesecloth for domestic use; (3) specialties such as tea bags, polishing cloths, wiping cloths and sanitary napkins; (4) cheaper grades of plain scrim cloth for curtains. The business comprises all operations from the purchase of baled cotton, through spinning, weaving, bleaching, special finishing and packaging, to sale as consumers' goods.

2. The plants of the corporation consist of a central plant, a finishing and distributing plant located in a New England town some twenty miles from Boston, which finishes the unbleached cloth into the various classes of goods for the market, and packages and markets them, and at which the sales and other general offices of the corporation are located; a second finishing and distributing plant about twenty miles from the central plant; and five cotton mills which spin and weave coarse cloth from raw cotton, located as a group in South Atlantic states six to seven hundred miles from the New England finishing plants, and seventy to ninety miles one from the other. The operations of these plants are so integrated that there is a flow of work from one to another analogous to the flow of work between departments of a single unit. There is in addition in Boston the office of the president and of certain staff assistants, whose work, however, keeps them in constant personal contact with the operating plants. The group of plants employs about 2300 people and consumes yearly about 30,000 bales of raw cotton.

3. The business represents a development from a single plant acquired by accident by the president some twenty-five years ago. This original plant, a small factory of wood construction on the site of the central plant, was a shoddy mill engaged in the manufacture of such articles as cotton bats, and rugs cut up from old carpets. It had been established in 1854 and during the Civil War, when there was a premium on shoddy, had made profits; but at the time it was acquired by the present management, business of that nature had so declined that this firm was hopelessly insolvent.

4. Although the plant was acquired by accident—with the motive chiefly of service to stockholders threatened by the insolvency of the business—the new owner believed there was opportunity in the development of a cotton manufacturing business with a sound policy, balanced organization and efficient management. The textile industry in the United States generally was still doing business as it had been done for the previous fifty years, and the new owner was somewhat attracted by the experiment of introducing scientific management of sales, production and finance into a field laden with so heavy a burden of tradition. He had had ex- textile plant, and he was convinced that those perience in the development of scientific management methods in other businesses, including one methods gave promise of profitable results if applied to a business in an industry which had remained static as to managerial methods for a half century or more.

5. The principles of scientific management to which reference is made are: (1) continuing research, investigation and experiment as the basis for every determination of policy and procedure in management; (2) the establishment of standards

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[1] Paper presented at a meeting of the Taylor Society, New York, December 8, 1927. Also presented before the Third International Management Congress, Rome, September 1927.

[2] The author desires to express appreciation to Dr. H. S. Person, Managing Director of the Taylor Society, for that encouragement and co-operation without which this paper would not have been prepared.

of policy and procedure—best known ways subject to evolution as better known ways are discovered —revealed by the investigations and experiments; and (3) a system of planning and control of operations in terms of standards as established. Inasmuch as the textile industry generally was facing a decline and this newly acquired business in particular was insolvent, there were present in the situation the necessity and opportunity to apply scientific management principles all along the line —in determination of policies as well as in merchandising, finance and production. The logical points at which to apply the new managerial point of view were; first, in determination of policy as to markets, products, and extension of the business; second, policy and methods of merchandising, production and finance; and third, policy and methods of relations with workers.

II. Determination of Policy

6. Investigation of the history and status of the textile industry disclosed that it had come to be a most disjointed and wasteful industry. Cotton manufacturing had got its start in New England about the beginning of the nineteenth century. In that day in a frontier environment a man of pioneering instincts would acquire a mill site on some stream, build a dam and small cotton mill, build a home on the hill beside it, and manufacture gray, or unbleached cloth, and himself sell it, by auction or in other ways. The cloth's identity with a particular manufacturer disappeared when it left the mill. He prospered because for many years the rapid growth, prosperity and increasing purchasing power of the country, and the increasing use of cloth, kept demand ahead of production. These early owners became prosperous, and for social reasons moved to cities and left the management of their mills to agents. They then ceased to be manufacturers. This situation gave opportunity for men who saw business in marketing the products of a number of mills, and the commission houses came into existence. The mill owners who had ceased to be manufacturers now ceased to be merchants. The commission houses came to enjoy great prosperity because of growing business, easy profits and moderate investment risks, and became factors, really the bankers, for the mills, loaning them capital secured by lien on accounts and stock. The mill owners thereupon ceased to be financiers. During this period there developed also a group of middlemen, who, not able or desiring to act as commission merchants or to render financial assistance to the mills, acquired the service of bringing seller and buyer together for a small commission; these were cotton goods brokers. Thus there came about a situation in the industry in which a number of specialists handled the products on their way from mill to consumer, each exacting his fee to cover his costs and net a profit. The habit of the industry was very likely compelled at the beginning by frontier conditions —the wide dispersion of consumer markets and the difficulties of transportation—but this habit, representing a highly disjointed and wasteful series of processes, became so firmly established by tradition that it continued to exist long after density of population and perfection of transportation had eliminated the environmental factors which were economic justification for its origin.

7. This analysis of the origin, condition and facilities of the industry led to the establishment of certain definite policies by the new owner and manager of the small shoddy mill which had been acquired by accident, and which was the nucleus of that business which some twenty years later was to acquire the new corporate name of Kendall Mills Inc. This policy comprised:

a. Elimination of items of the old business which had not been profitable and for which there appeared to be no prospect of profitable markets; and concentration on one section of one division of cotton goods—the gauze and cheese cloth section of the print cloth division of the industry.

b. Constant study of the market and of possible uses of converted gray goods for the purpose of discovering and creating new uses and new demands for the products.

c. Integration of the series of processes which had become so disjointed in the industry generally, and consolidation under one general management of all processes from purchase of baled cotton— as nearly as possible directly from the planter—to marketing—as nearly as possible directly to the consumer—of packaged items carrying a trademarked name and forever identified with the particular manufacturer and a particular high quality of service.

d. Constant study of new methods with respect to all the processes of fabrication and of distribution, for the purpose of eliminating those numerous wastes and costs which are present in an industry so disjointed in its organization as this had come to be.

e. Establishment of economically balanced functional units in the total series of processes, each of which would perform its function with precision in the best known way; and the establishment of a control of a flow of work from one unit to another—which in time came to be also from one factory to another—which would effect continuous processing, continuous employment, continuous utilization of equipment of highest technical quality, the shortest possible turnover, and minimum investment of capital in equipment and in materials.

f. Establishment, as the growth of the business would warrant, of specialized units with single purpose equipment, an element of policy which was facilitated by the limitation of the products to one class of cloths—print cloths—and by the fact that the various items within that class utilize uniform counts of thread and vary as to weave within the range of 20 x 12 to 48 x 44 threads per inch on widths which can be economically woven on forty inch looms.

g. Extension of the properties, as development of the business would warrant, by the purchase, as they might be for sale because of financial embarrassment, of existing mills located in South Atlantic states and having buildings of reasonably modern type which could be easily enlarged and adapted, situated in the country outside cities and towns, with ample land, and equipped with machinery reasonably good and fairly well arranged. Inasmuch as southern mills located in the country have to provide housing for their people, the properties acquired should have lands of such extent and nature as to permit the economical development of model factory villages.

h. The retention of the original New England plant as the finishing and marketing plant, to be supplemented if necessary by additional finishing plants in the same regions; the utilization of southern plants for the manufacture of unbleached cloth for these northern finishing plants; and the acquisition of these southern mills only fast enough to supply seventy-five to eighty-five per cent of the gray cloth ordinarily required by the finishing and the marketing units of the organization. The additional fifteen to twenty-five per cent requirement of gray goods could be bought in the open market, which would permit the maintenance of continuity of processing and of employment in the cotton mills organized to take care of the base load instead of peak load requirements.

i. With respect to industrial relations, the establishment of wholesome and pleasant mill villages; with comfortable homes, churches, schools and places of amusement; landscaped and improved streets; citizenship and community self government; and the development generally of a collective spirit of good will which should embrace ownership, management and workers without distinction.

III. Organization

8. The organization of Kendall Mills Inc. is completely functional; i.e., according to the technical requirements of the business, functional responsibilities are clearly delineated and defined, and the various executives have complete responsibility and therefore adequate authority within their respective fields of responsibility. Any individual in the organization may communicate directly with any other individual on matters pertaining to his responsibility without the necessity of the communication passing through an intermediary "authority." So highly regarded is individual initiative and responsibility under clearly defined functional organization, that one reason the owner and manager maintains an office in Boston, separate from the general offices of the business, is to avoid the danger of his being constantly consulted by executives on details of their managerial responsibilities. The other reason is to assure himself freedom for assumption of his own responsibility the nature of which is indicated below.

9. Because of the natural grouping of functions as well as because of the geographical distribution of properties, the organization of Kendall Mills Inc. consists of four principal parts:

a. The general administrative functions, carried on at the Boston office of the president and certain assistants.

b. The general business functions—general purchasing other than of raw cotton, merchandising, selling and advertising, general and cost accounting, credits and collections, traffic, statistics, the preparation of schedules, and so on—located at the main outlet plant. These general business offices are located at this plant for reasons of convenience only, and could be lifted bodily and put down at some other location without impairing their operations.

c. The primary manufacturing functions—conversion of raw cotton into the gray cloth which becomes the raw material for the two northern mills—carried on in the five southern mills located in a region favorable from the point of view of power costs, labor costs, and proximity to the sources of raw cotton.

d. The subsequent manufacturing functions—bleaching, finishing, dyeing and other conversion of gray cloth into various forms for the market—carried on in the two plants which are located in the north.

IV. General Administration

10. These functions are carried on at the Boston office of the president. The responsibility which he assumes comprises in general the maintenance of perspective, and in particular the study of industrial conditions and tendencies, formulation of policy, general maintenance of credit relations, appraisal of summarized reports of accomplishment, periodic conferences with all executives on fundamental problems, regular visits to the various plants, and attention to exceptional problems arising anywhere within the organization.

11. In the Boston office are staff assistants who aid in general supervision of mill and factory management. They are responsible, for example, for the maintenance of detail contact on behalf of the president with all units of the organization, for the summarizing and interpretation of reports and the formulation of recommendations, and for the detail interpretation of ideas, policies and plans to local managers.

12. In the Boston office also is located the cotton purchasing and classifying unit. Later explanation of the importance of this function will indicate the reason for its location in the general administrative office.

V. General Management

13. In the general office, located at the central plant, the principal divisions are:

a. Merchandising and selling, in charge of a Vice-President. This phase of the management will be considered in detail below.

b. Finance in charge of a Comptroller. He attends to current banking needs, in accordance with general credit relations established by the president, and supervises credits and collections, general accounting and cost accounting, statistical analyses of operations, insurance, taxation, and so on.

c. Traffic, in charge of a Traffic Manager. This function is concerned with all traffic problems; in particular the routing and moving of purchased materials from points of purchase to the various plants; the routing and moving of gray goods from the mills located in the north to those located in the south; and the routing and moving of out shipments of finished products to various points of destination.

VI. Merchandising and Sales

14. The principles of scientific management—research, establishment of standards, and control of operations—which generally in the United States are most utilized in the management of shops, are applied by Kendall Mills Inc. also to the management of merchandising and selling.

a. Merchandising and selling are in charge of a Vice-President on whose staff are a Sales Manager and an Advertising Department. Supervised by the Sales Manager are four division heads; one in charge of the sale of surgical and hospital supplies, one in charge of the sale of merchandise to dry-goods stores, another in charge of sales of specialties to manufacturers, and the fourth in charge of sales to curtain manufacturers. Distribution is effected through branch offices in the United States, a Canadian subsidiary company and an export department, each with its own staff. There is in addition to the regular selling staffs of these branches, a free-lance staff of research and salesmen which may be detailed into any territory for any purpose.

b. With respect to merchandising, continuing attention is given to the study of economic conditions and market trends; to the study of particular markets for Kendall Mills products and of trade channels leading to the markets; to study of the products, their uses, forms, packaging, etc.; and to study of the problem of how to market the commodities manufactured.

c. As a result of these investigations, standards of merchandising operations are established. Sales are carefully budgeted and quotas established as to territories and classes of trade.

d. Sales operations of the branch offices are planned at the central office and branch office stocks are centrally controlled; assistance is given branches and salesmen through letters, instructions and conferences; and constant appraisal of efforts and results is maintained at the main office through statistical analysis of continuing reports from the field.

e. Interest in achievement of results is promoted by incentives of various kinds: in senior executives through stock participation; in junior executives by profit sharing; in branch managers and salesmen through quotas and bonuses for achievement and exceeding of quotas.

VII. Primary Manufacturing—The Cotton Mills

15. The five gray goods mills, located in North and South Carolina, six to seven hundred miles from the general offices and the northern plants, are under the general supervision of a general manager whose responsibility corresponds to that of the General Manager of the two northern plants, and are immediately in charge of individual mill supervisors.

16. These mills are essentially continuous process mills, for the variations are so limited in the gray cloths required by the northern plants, that each of the southern mills can be given definite standard constructions—picks per inch or loom width—to produce continuously. In these mills, therefore, the problem of planning and control of operations is not one of adjustment to repetitive and varying orders, but of maintenance of unvarying quality of raw cotton and of unvarying perfect condition of machines and of working conditions, and of the attainment of predetermined standards of output.

17. As each of these mills is acquired, it is immediately brought up to best modern conditions with respect to building, light, heat, ventilation, humidity control, machines, and so on. These matters are the responsibility of a staff of specialist experts. When the mill is in proper condition for operating, definite schedules of maintenance inspection are formulated with the purpose of obviating interruptions to continuous processing through impairment of equipment. There are definite schedules and a system of planning room control for such things as painting, oiling, cleaning, overhauling, belting wear and tension, and renewals. At scheduled intervals each machine is taken down, inspected and adjusted in every part even though periodic inspection may not have discovered signs of deterioration. Maintenance is scheduled by four-week periods for several years in advance—whether it involves the triennial painting of the mill, the annual taking down of a motor, or the periodic relining of a spinning frame—and a maintenance budget is constructed which through a standard burden rate distributes the costs of the long period evenly over the successive four-week periods. As a consequence of these maintenance-control methods, a mill operates continuously with a minimum of breakdown, and maintenance is effected more precisely and economically than would be possible if attended to after breakdowns.

18. Maintenance of uniform quality of raw cotton is of equal importance to the maintenance of perfect condition of equipment. The raw cotton can be precisely standardized, because, although the gray cloths produced vary as to closeness of weave, they do not vary as to size and quality of the yarn. After the most desirable standard of raw cotton has been determined by experiment—the best combination of character, color, staple and grade—cotton of that quality only is purchased, and expert inspection of all receipts is the basis of a most rigid practice of acceptance or rejection. Because of its importance, all inspection and classification of cotton is made by samples in the Boston office. It is interesting to note that, as soon as standardization, inspection and rejection of cotton below standard become established as fixed practices, delivery of cotton below standard practically ceases.

19. The standardization of these mills with respect to loom construction, conditions of equipment, quality of raw materials, and otherwise, makes possible a functionalization of labor with respect to skill requirements of the different operations. Workers are assigned to operations in accordance with the kinds and degrees of their skill and the kinds and degrees of skill required by the operations; and labor of any particular kind and degree of skill is not utilized on tasks requiring skill of lesser grade.

20. Predetermined maintenance of equipment and of raw cotton quality, and the functionalizing

of labor as to skill requirements, have so influenced operating conditions as to effect marked decreases in unit costs, even though wages are higher than the wages for corresponding operations in the community; because with equipment in perfect condition and even running raw material, weavers and spinners are able to tend from two to three times as many looms and spindles as they have been tending before such maintenance control is developed.

VIII. The Northern Plants

21. The two northern plants are in charge of a General Manager and of individual plant managers. The central plant bleaches, finishes and packages the white absorbent cloths for surgical use, the dry goods trade and other markets. The other plant, when demand requires, can also produce these white absorbent cloths, but it is concerned principally with bleaching, mercerizing, dyeing, calendering, starching and other finishing for general purposes.

22. These mills are concerned in part with continuous processing—as in bleaching and primary finishing—and in part with intermittent processing—as in final preparation of items for the various consumer uses in accordance with the varying influences of demand on depletion of finished stores. They operate on production schedules based on sales schedules. The individual plant managers are trained in Taylor methods, and processing is planned and directed by a fully developed Taylor planning room, control being secured through complete standardization of products, materials, equipment and methods, through precise control of materials in stores and in process, and of machine and labor time, and through continuing inspection of results in terms of plans. All accounts—general as well as cost—are on a four-weeks basis, and complete financial and analytical cost statements are derived every four weeks.

IX. Industrial Relations

23. Although in other plants in which he is interested, where there are organized crafts, the president of Kendall Mills Inc. has established the policy of working agreements with craft organizations, in the Kendall Mills none of the crafts is organized. It has been the policy to establish the best working conditions in the mills, develop sanitary and pleasant factory villages, inspire wholesome and attractive community life and citizenship and self government; and generally, for its educational influence and creative power of good will, to develop a spirit of community of interest embracing workers, managers and owners.

24. When a purchased mill is remodeled and re-equipped, provision is made for the best conditions of light, heat and ventilation, adequate sanitary and toilet facilities are provided and a first aid dispensary organized. In the southern mills the factory nurse becomes a visiting nurse for the community, and her work is concerned with general health and hygiene. Inasmuch as all workers in these country villages have homes but a few minutes' walk from the factory, such items as rest rooms and lunch rooms are not essential. They are provided, however, in the northern plants.

25. At the same time that arrangements are made for remodeling of the factory, arrangements are made for the development of a comfortable factory village. Streets are resurfaced, sidewalks built, landscape gardening begun, and workers' dwellings remodeled and equipped with baths and other conveniences. Churches are repaired and painted, or perhaps built, and facilities of entertainment are introduced. In various ways residents of unclean and anti-social habits are persuaded to move elsewhere. Eventually these southern mill workers from the agricultural back country and the mountains, who have had no experience in community self government, are led to take over the government of the factory village.

26. To broaden the point of view of executives of all grades, to develop widely diffused interest in the business and in management, and generally to inspire morale and better team work in "playing the game of work," it is the policy of Kendall Mills Inc. to promote intraplant conferences and interplant visits.

a. Southern managers' meetings are held monthly, at a place convenient for the five mill managers, to discuss their common problems; and if a particular process—say weaving—is to be discussed, all boss weavers will be present and free to participate in the discussions. Encouragement is given to everyone to co-operate in improvement of methods and machinery; and foremen are encouraged to go back to their workers as teachers and as inviting suggestions from the members of their respective groups. It should be borne in mind that functional organization with its free intercourse is essentially *instructional* organization.

b. There are constant intervisits between the mills of the southern group, and every year a party is brought from the southern group of mills to visit the northern mills. In the party will be mill managers, overseers, office men, nurses, school teachers, and so on. They meet the entire organization in an informal way; they see the product, for which they have made the gray print cloth, all the way through to the finished product. They are entertained by the president of the company and by other executives. They are taken around to see the places of historic interest in and near Boston. Likewise, managers, superintendents, inspectors, sales executives, planning room executives and others of the northern mills are encouraged to visit the southern mills. All go back to their places of responsibility with better understanding of the business as a whole, of the relations of processes, of the part played by the processes for which they are individually reponsible, of the importance of a one hundred per cent as compared with a seventy-five per cent performance, and—most important—with the spirit of co-operators rather than of individualists.

27. The business has met with prosperity as it has expanded rapidly from small beginnings, the greater part of the expansion having taken place during the past five years of severe depression in the textile industry. This prosperity has not been achieved through a lowering of manufacturing costs by depressing labor below proper standards of living; it has been achieved by paying wages above the market and securing economies through waste-eliminating methods of management. The management believes that good wages and low costs are not incompatible, and it has maintained a corresponding policy. The management believes also that with increasing opportunity in industry there is increasing responsibility. While not unmindful of the importance of the stability that is coupled with material success, their interest is quite as much in producing better citizens as in securing profits.

Annual Business Meeting

The annual business meeting of Taylor Society Incorporated was held at 4 P. M., December 8, 1927, in Room 611, 29 West 39th Street, New York, N. Y.

The call to order by President Cooke was followed by determination of the presence of a quorum and by reading of the official notice of the meeting.

The Managing Director then made an informal statement concerning the affairs of the Society since the previous annual meeting. Matters of outstanding interest were a gift which had enabled the Society to liquidate all outstanding indebtedness and begin the new fiscal year with a surplus amounting to $1,935.22; a gift which had permitted the establishment of the James Mapes Dodge Fellowship in Scientific Management; and contributions which assured the founding of the Keppele Hall Tribute Library.

The report of the Treasurer was then received, accepted and placed on file.

The ballot Committee then reported the results of the letter ballot for election of officers, as follows:

President and Director—Morris L. Cooke to succeed Morris L. Cooke.

Vice-President and Director—George D. Babcock to succeed Howard Coonley.

Treasurer and Director—Edward Clark 3rd to succeed Edward Clark 3rd.

Director—G. E. Schulz to succeed H. K. Hathaway.

Director—B. Eugenia Lies to succeed Lillian M. Gilbreth.

Officers whose terms have not expired are:

Vice-President and Director—C. L. Barnum.

Directors—N. G. Burleigh, H. S. Person and A. B. Rich.

The following were then chosen to constitute the Nominating Committee: Robert Andersen, Auburn, N. Y.; A. L. Kress, New Haven, Conn.; Philip Moen, Providence, R. I.; Mary van Kleeck, New York City; John H. Williams, New York City, Chairman.

It was then voted that the Managing Director send on behalf of the members appropriate letters of thanks to Mrs. Frederick W. Taylor, Mrs. James Mapes Dodge and Mrs. Keppele Hall for contributions to the Society during the year.

Scientific Management in Manufacturers' Marketing[1]

In Which a Sharp Distinction Is Drawn Between Merchandising and Selling

By HENRY S. DENNISON
President Dennison Manufacturing Company, Framingham

I. Merchandising

THERE is a complete lack of an accepted definition of the term "merchandising." Text books use it as synonymous with selling and with marketing. Some writers speak of it as an integral part of advertising, while others deny that it has any connection with advertising whatsoever. To individual companies the term means anything from so relatively simple a thing as the operation of warehouses to such a complex series of relationships as the whole field of service to dealers. Department stores have used the term to cover the whole field of selecting desirable merchandise, buying it at advantageous prices and displaying it in the store so as to attract the greatest number of purchasers.

In the history of the professions there is a noticeable trend from generalization to specialization and ultimately to co-ordination of the two. Thus years ago the field of engineering consisted of only one branch. In time civil engineers were separated from the main branch purely as a matter of convenience to distinguish the activities of surveyors in civil life from the activities of surveyors who were part of the military. And then the Industrial Revolution, and later the recognition of the line and staff principle as applied to the factory system, broke up the engineering profession into almost as many units of specialization as there are staff functions to be performed. Later still the term engineering came to have the wider application to any part of industry which is a piece of specialized practice, regardless of whether it be a purely staff operation or not.

Sales management has repeated the essentials of this history of engineering. Out of the functions that have evolved from the general field of management, there is to be recognized one as standing as a co-ordinating force between the job of selling goods and the job of manufacturing the goods to be sold. The function which has been so separated is, in general terms, to provide that the goods manufactured are of proper quality and in proper varieties, in sufficient quantities and sold at prices best suited to the market. This is the function that we of the Dennison Manufacturing Company term "merchandising."

Over a period of years, the task of merchandising has been found to consist of four elements. These are:

1. The study of the merchandise relative to:
   a. Creating new merchandise
   b. Finding new uses for standard merchandise and
   c. Watching the trends of the market, particularly to avoid the retaining of items that give indication of becoming obsolete.
2. The study of the merchandise relative to estimating the amount of production necessary to most important—with the spirit of co-operators meet the market requirements at different seasons and periods.
3. The study of the merchandise relative to making price estimates on special merchandise and to making changes in list prices of stock merchandise.
4. To make each line of merchandise of continuing interest to the selling organization.

To carry on this job of merchandising calls for a very special set of qualities. The successful merchandiser must have analytical power of no mean order. His analytical power must be buttressed by an exhaustive knowledge of the goods he is merchandising and a working knowledge of the businesses of many other people who may use the goods. Not only must the merchandiser have a background of facts, but he must, as co-ordinator between factory men and sales department, be able to put his deductions from these facts before a great many different sorts of people. This is a teaching problem, calling both for patience and resourcefulness. This means, too, that while the merchandiser has his headquarters at the factory, a great deal of his time must be spent in traveling, so that he always has a direct contact with market conditions.

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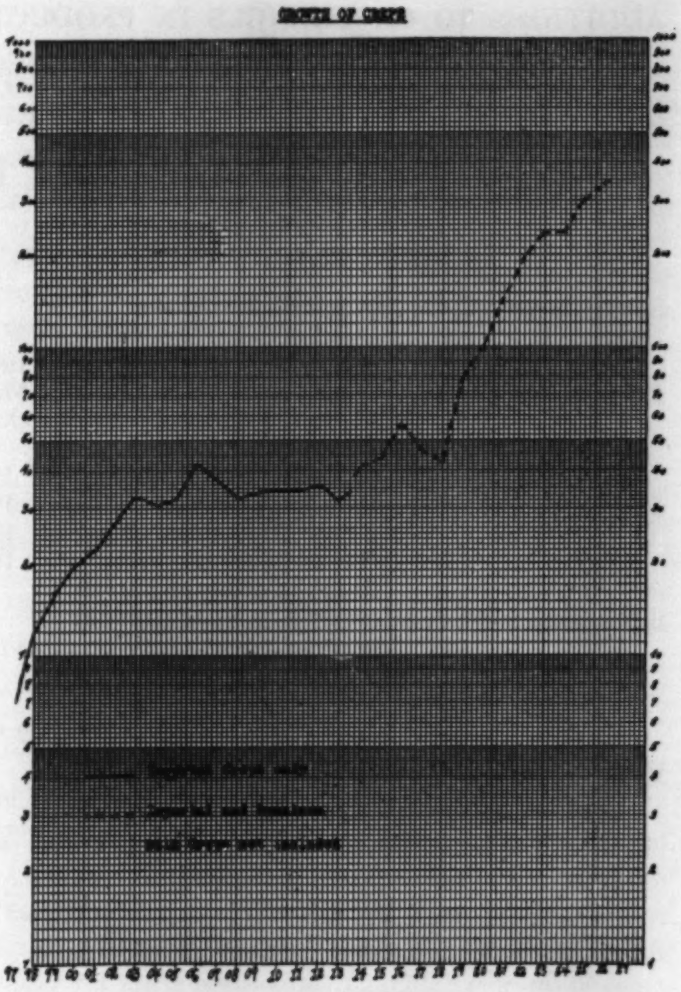
[1] Paper presented at a meeting of the Taylor Society, New York, December 10, 1927. Also presented before the Third International Management Congress, Rome, September, 1927.

More than all else, the merchandiser must have and use constructive imagination. If he only piles up trade facts he becomes pedantic. If he is only imaginative he may be foolish. But by applying imagination to the facts of his merchandise and keeping in mind the total situation, he builds a solid basis for successful merchandising. So much for the outstanding qualities required in the merchandiser. As a next step, let us follow him through the four parts of the merchandising task.

It is essential in a going concern that new items of merchandise be added as young and vigorous members in the family of items. A study of our growth shows the years during which the impetus from new items has come. When domestic competition on crepe paper became active in 1895, we found it necessary to launch our own domestic line. On July 1, 1897, this line was trade marked Imperial crepe. It sold for ten cents per roll as against fifteen cents per roll for the imported. Sales of Imperial crepe increased rapidly till the peak year of 1906 when 3,600,000 rolls were sold. After the panic of 1907 crepe sales fell off even more than the Dennison line as a whole. In 1908 an unsuccessful attempt was made to increase sales by putting out a cheap crepe—"National"—to be sold at three and three and one-half cents per roll to wholesalers only. From 1908 to 1912, when the business as a whole was growing, Imperial crepe sales continued at almost the same level; and for 1913, while charges for the year showed a three and six-tenth per cent gain over 1912, sales of Imperial crepe fell off over ten per cent. The situation was serious. In October of that year, therefore, it was decided to adopt "Dennison" crepe, a finely creped, lustre-finished paper which was much better than anything on the market. This new product, launched early in 1914 in a distinctive folder, retailing for the same price as Imperial, met with an immediate success, which was retarded only by the war. From 1918 to 1926 the curve of crepe sales shows an increase of 745 per cent in eight years, proving that one way to meet competition successfully is to put out a better product than the market is used to, not a poorer one. (See Chart.)



Indeed, a study of the earnings of a series of companies shows the same thing. A case in point outside our own company is that of the Savage Arms Company, makers of fire arms of different types, who have recently added to their line of manufacture an electric washing machine for household use. Inasmuch as this machine required no new manufacturing equipment and is in line with a growing use in this country of electric household devices, the impetus given the sales of the company has been reflected very quickly on the balance sheet. (See Table.) The merchandiser is always studying the possibilities of any number of such items and makes a choice of those which seem to offer the prospect of widest success in connection with present goods.

New uses must be found for merchandise that has become standard through wide use. For years the yeast companies have been making compact packages of yeast for household and commercial

ADDITIONS TO OR CHANGES IN PRODUCTS MANUFACTURED BY VARIOUS COMPANIES SHOWING SUBSEQUENT NET INCOME

Company	New Product	Approximate Date of Acquisition	Net Income (000 omitted)				
			1922	1923	1924	1925	1926
			$	$	$	$	$
Savage Arms	Washing Machines	1923	168	404	694	523	627
Quaker Oats	Quick Quaker	1923	4,633	4,389	5,287	5,503	8,151
Postum Company	Jello	Jan. 1926	2,497	2,881	4,105	4,684	11,317
	Swansdown Flour	Mar. 1926					
	Minute Tapioca	Oct. 1926					
du Pont	Gen. Motor Shares	1926	9,991	18,313	17,031	24,034	41,970
	Duco	1925–26					
	Fabrikoid Goods	1925–26					
	Ethyl Lead	1925–26					
	Rayon Manufacturing	1925–26					
Sears Roebuck	Establishment of branch over the counter stores in various cities		5,435	11,513	14,354	20,975	21,908

In some of these cases it took considerable time to get the development of the new product under way so that a noticeable impression was made in sales.

baking. Suddenly the fact that yeast contains a great deal of the Vitamin B opened up a whole range of new uses for this very ancient product. Alert merchandising has dictated that the total conception of what constitutes the market for yeast be revised on the basis of the new fields of utility that have been opened before it.

The trends of the market must be carefully watched. Items become obsolete very often through the use of substitute items that offer greater value in use and are many times accompanied by greater attractiveness in price. Some items it pays to drop; some it pays to fight for. Particularly is this true where the style element enters. The merchandiser must give the answer.

The second major element in the Dennison definition of merchandising is responsibility for the amount of production. The factory always wants to know how much production is to be expected of it over given periods. With this information it can plan for runs of production, size of operating crews and equipment necessary to make the most profitable operation. Factory estimates, naturally, will always be guided by what is the best factory production schedule rather than by what the market demands. Salesmen, if asked to estimate, often state views that are largely colored by the state of mind of the last two or three customers with whom they have talked. Neither factory nor selling organization can estimate dispassionately since both are directly interested parties. Consequently the job of estimating the production required over a stated period is best done by the merchandiser. He has a first hand knowledge of the market and both the selling and the factory organizations are freely consulted in the making of these estimates, as are the statisticians and economists. But the final estimate is made by the merchandiser. Inasmuch as careful figures are kept, showing the inventory of each line, the merchandiser has every incentive to estimate as carefully as he can, using all the tools that are available.

The third major element in Dennison merchandising is that of pricing. This has two angles. The first of these is the pricing of special orders. In certain market conditions estimates are made so that the order may be placed with Dennison even though there may be no apparent profit in the order as such. If the market is easier a better profit may be sought. But in either case, because he knows the market condition on the one hand and because he knows the factory condition on the other, the merchandiser is in an excellent position to give a decision which will mean most for the business as a whole.

The orders which cover our standard merchandise are priced in standard lists. But market conditions affect standard merchandise as much as they do special goods. Moreover, changes in production methods often make profitable lower prices which enable other levels of purchasing power to be reached. Then, too, that which has been a novel unit of gods might have become standard and list prices must be made for it as standard goods. To decide just when these things come to pass is a function of the merchandiser. Being in the coordinating position, the merchandiser is not stampeded by customers' demands, and he can consider what price changes will mean in terms of factory production schedules. Price changes therefore are all given most careful consideration. But here, too, it must be borne in mind that while the decision is the merchandiser's, in arriving at it he may consult information sources of many types. It would be suicidal did he not do so, since his decision touches so many different branches of the organization.

The fourth major element in merchandising is the building up of a continuing interest in each line on the part of the men who actually sell the goods and on the part of customers who may give invaluable opinions about the goods. Merchandise men spend at least one third of their time in the field with salesmen and with customers. Salesmen are shown new facts about the particular lines of goods, old facts are repeated and new items are introduced. It is of real consequence that customers whose opinions are respected express these opinions in the most useful fashion. The obtaining and weighing of this customer opinion are responsibilities of the merchandiser. Because he is not bargaining with a customer as a salesman is the opinion he gets is not colored by the customer's desire to make a good trade or biased accordingly.

Merchandising, as described above, is truly a catalytic agent. It not only makes co-ordination possible, but is a positive force towards leadership and progress. It recognizes consumers' demands as the origin of economic impulse and as dynamic and changing. Production must discover these changing demands and adapt itself to them.

II. Selling

Sales operation has to do with the arrangement of territories and the management of salesmen. To these problems there are at least three units of scientific management practice which may be applied. These three are (1) the use of research and analysis so that precise data may be added to rule-of-thumb information (2) planning the work to be done and (3) the possibility of some degree of functionalization.

A. Research in Selling

The places where research in selling might be used are of course legion. For the sake of a working program, however, five fields of effort will be touched upon. These five are analyses of (1) the job of selling (2) salesmen's compensation (3) trading areas (4) sales figures (5) orders.

1. The Job of Selling

One of the first things which calls for research and analysis is the job of selling. Precisely what does a salesman do? Anyone can tell you in vague terms what a salesman does, but almost no one has ever written down the job item by item. As a first step a good many cases would have to be recorded before the common elements could be isolated and before a true list of unit operations could be found.

If the facts of what selling is are actually known, or perhaps even without this information, a study of the time it takes is another fruitful field of research. For example in our sales organization, a rather cursory type of general time study brought out the fact that only twenty per cent of a salesman's time was actually devoted to selling. The exact distribution of time to selling and to miscellaneous activities is shown in the following table.

In the more exact knowledge of what constitutes the task of selling, more accurate methods of compensating sales effort may be evolved than now exist.

2. Salesmen's Compensation

The problem of what constitutes proper compensation for the sales force as a whole and for individual salesmen in particular is an extremely important one. In the United States there has been

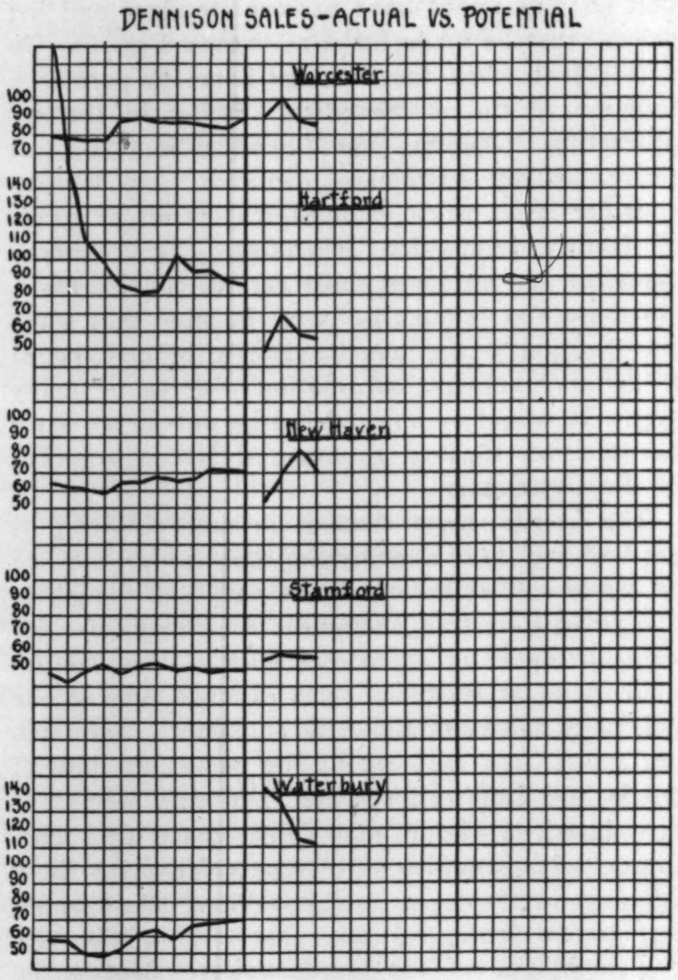
Distribution of Time

Classification	Per Cent of Total Business Time (Except Overtime)	
Sales Conversation		
Taking Stock	3	
Other Sales Conversation	17	
Total Sales Conversation		20
Other Conversation		5
Traveling		
Between Customers	5	
Between Towns (reg. time)	20	
Between Towns (overtime)	15	
Total Traveling		40
Waiting		
For Transportation	5	
Before Calling	9	
After Calling	7	
Total Waiting		21
Other Time		
Care of Samples	7	
Catalog, Sales Letters	5	
Letter Writing	2	
Total		14
GRAND TOTAL		100

no end of information exchanged about it, but no scientific evaluation of this information has ever been attempted.[2] Time rates, piece rates, and incentive rates are all being used and all have distinct limitations. No one of course ever expects to find the one standard method of wage payment, but it is possible to look for solid bases upon which to build whatever compensation methods are used.

3. Trading Areas

Another major field for research and analysis is a study of trading areas. Through researches made by the Federal Government trading areas are being defined and certain major facts about them are being established.[3] There remains the problem of working out indexes of the purchasing power within these areas and checking sales against these indexes. An index which the Dennison company is using is that of bank debits. The results for several cities in New England are shown on the following charts. A more elaborate index by state lines and by particular lines of merchandise is also being used as a piece of experimentation.



A MEASURE OF SALES BY TOWNS

The tables shown below and the accompanying charts are illustrative of a new measure of Dennison sales as compared with general business in the principal towns of the country. This has been worked out by applying an index of bank debits for each town (as compiled by the Standard Security Service) against a five year base comparing this with Dennison sales applied to a similar base, both of these cumulative through the months of each year. The apparent advantages of this method are: (1) The fact that all towns throughout the country are on a comparable basis; (2) That the source of the figures is well known and they are easily obtainable; (3) That they are obtainable within two weeks after the close of the month; (4) That the indexes arrived at for each town show the condition not only for one town to another but of one period of time with another and at the same time show also the trend.

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[2] For the past three years twenty-six major articles have appeared in our leading magazines dealing with this subject —an average of one every two weeks. In addition to this there have been a host of conferences of sales executives to go over this problem. If the records of these conferences were added to the articles mentioned above, we would have a volume of literature running into thousands of pages.

[3] The U. S. Department of Commerce has finished a study of the Philadelphia marketing area and has issued its findings in a report entitled "A Commercial Survey of the Philadelphia Marketing Area." Similar studies of the Baltimore, Maryland, and Providence, R. I., marketing areas are well under way or completed. A wider study of New England as a whole has also been completed in its preliminary stages.

As an example of how the figures are obtained, Boston is cited.

		1 Month	2 Months	3 Months	4 Months
Dennison Sales	Base[4]	$61,000	$113,300	$168,300	$214,600
	1927 Sales	76,600	151,000	211,000	267,000
	% to base	125%	133%	125%	125%
General Business[5]	Base[4]	110	200	304	406
	1927 Business	145	267	414	552
	% to base	132%	133%	136%	136%

This shows that both general business and Dennison sales in Boston have been higher than the base for each period so far this year. However, our sales did not show as large an increase above the base as "general business." Therefore, in theory at least, we are not doing quite as much as we should do. This is shown as follows:

	1 Month	2 Months	3 Months	4 Months
Dennison Sales %	125%	133%	125%	125%
General Business %	132	133	136	136
% which we are obtaining of what we should be obtaining	95	100	92	92

For four months then we are getting eight per cent less than we should. We must assume that during the years 1920 to 1924 we were doing an average business—in other words, that we are using a fair base. While we have to be arbitrary in the selection of a base, we have used the base that is most usually selected for comparisons of this nature.

A sample map indicating the studies of one line of merchandise is given here.[6] As a further refinement, these indexes may be broken down by specific trades or by types of customers, although it should always be remembered that too great refinement leads to greater cost than any return from it could justify.

One outgrowth of this kind of study is that almost certainly it leads to some kind of modification of the regional sales organization. Usually regions are set up quite arbitrarily and new facts are bound to make for changes.

4. Sales Figures

A careful examination of the figures covering past sales yields valuable information. One type of thing it is worth while to study is the place of origin of the sale. This place of origin has two aspects, (1) the type of population area, that is, city, country or suburban and (2) the type of trade or customer. This kind of study combined with corresponding sales expense figures shows in a general way at least where the greatest sales effort should be thrown. It also is a guide in determining which type of selling method may be used most effectively in particular sections. A recent study in our company, for example, showed that over half of our total sales came from twenty-six of the major cities of the country, a significant fact for our guidance.

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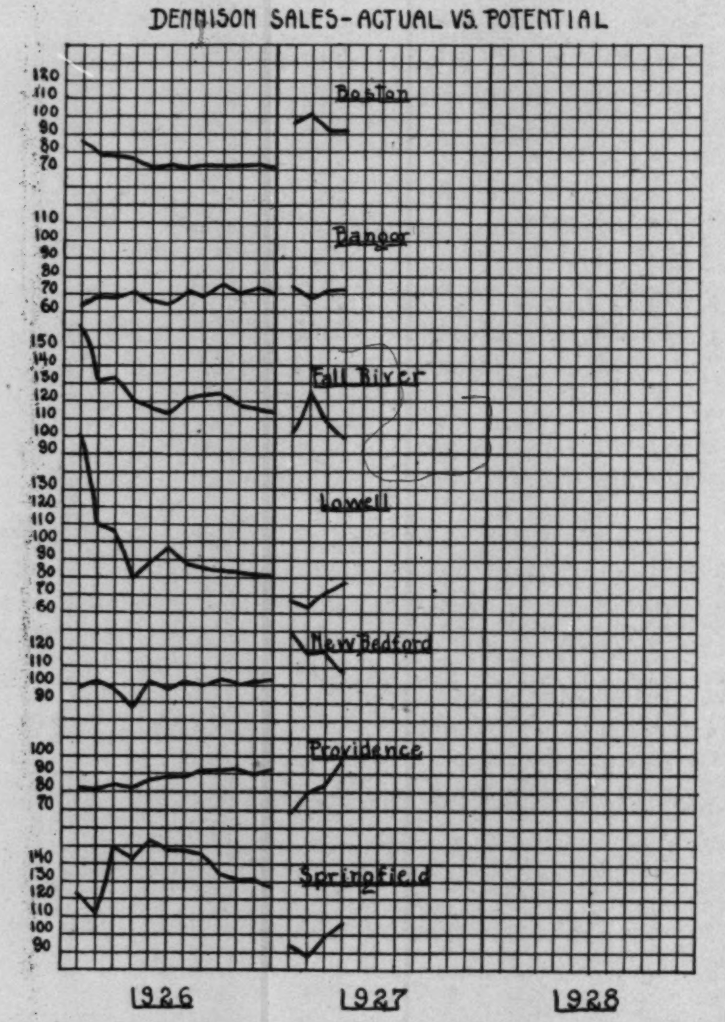
[4] 5 years, 1920-24 inclusive.

[5] Standard index of bank debits.

[6] The index used in this map to measure the purchasing power by states is made up of such things as automobile registrations, income per capita, number of retail outlets, income tax returns and total population.

The cost of getting sales is always of prime importance. Analysis of sales figures may show these costs from two very interesting angles. The first of these is to show the cost of population areas. In the study mentioned in the last paragraph, for example, it was shown that for traveling expenses, city sales cost about $2000 while sales made outside the cities cost $200,000. That is to get half of our total sales we spent $2000 in traveling, while to get the other half we had to spend one hundred times as much.



Within geographic areas it is worth while to know what it costs to sell individual trades. The following table shows what one analysis of sales figures showed us. To be able to distinguish high cost trades from low cost trades is an immense help in the entire effort to distribute merchandise in the most profitable fashion.

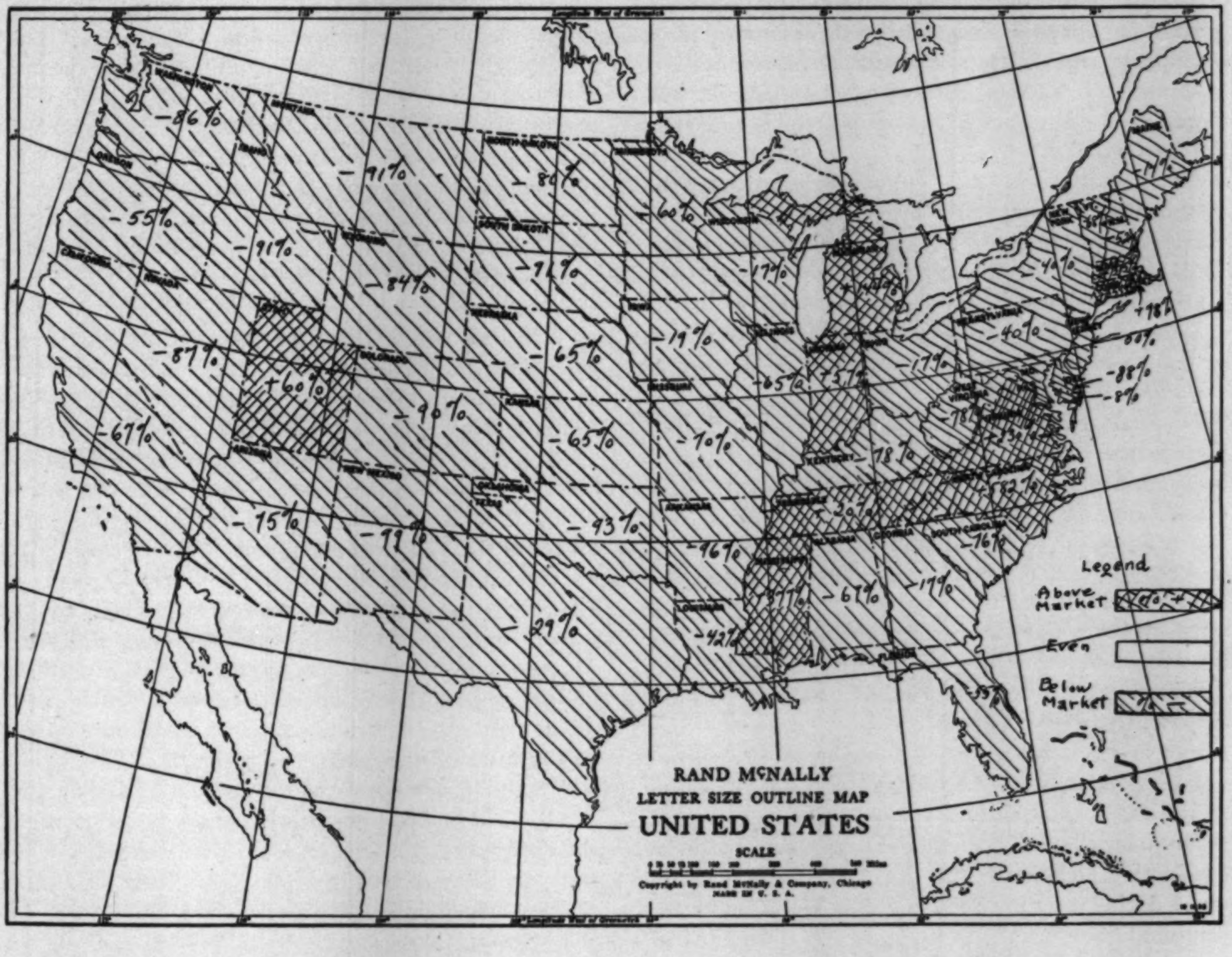
SELLING COST RESEARCH

Below is listed the cost per sale dollar by trades.

The figures in italics show the trades whose total is more than twelve cents per sale dollar.

Manufacturing Group	1924	1925	1926
Mfgrs. of Hdwe. & Elec. Goods...	.058	*.16*	.065
" " Cloth Goods...........	.023	.068	.03
" " Cloth and Yarn.........	.042	.066	.057
" " Rubber Goods..........	.038	.067	.041
" " Confections	.061	.112	.067
" " Heavy Goods..........	*.167*	.055	.086
" " Light Goods...........	.05	.097	.050
" " Fertilizer	—	.017	.017
" " Oils & Paints..........	.065	.072	.066
Brass, Iron & Steel Cos..........	.069	.064	.068
Ice Cream Mfgrs. & Dairies......	.107	.069	.088
Retail Group			
Department Stores..............	.092	.109	.098
Retail Clothiers.................	*.18*	.117	*.149*
Retail Furniture Stores..........	*.182*	*.172*	*.178*
Ladies Wear Stores............	*.154*	*.148*	*.152*
Other Retail Stores.............	*.24*	*.237*	*.24*
Miscellaneous Group			
Wholesalers	.109	.102	.105
Produce Dealers...............	*.32*	.092	*.165*
Laundries	.116	.089	.091
Garages	*.292*	*.157*	*.252*
Public Organizations............	.066	*.153*	.087
Bank and Insurance Cos.........	.11	*.159*	.12
Florists	*.15*	.119	*.14*
Storage and Transfer Cos........	*.147*	.086	.11
Hotels and Restaurants..........	.061	.045	.055
Railroads	.092	.066	.078
Packing Houses.................	.035	*.288*	.043
Bakeries	.05	.087	.055
Miscellaneous	*.174*	.044	.084

It has been said time and again that it is not the initial order that really counts, but the reorder, which is the symbol of a continuing relationship between buyer and seller that to be continued must be mutually beneficial. Analysis of sales figures showing the proportion of reorders to new orders and the proportion of both to the total volume of orders is one very good objective standard of measurement for that vital but intangible element called the good will account.



A study of the total volume of sales relative to net profits, often yields splendid dividends. The desire to get larger and larger volume of sales may very readily lead a company to the point of diminishing returns in net profits. Some types[7] of merchandise inherently cannot go above a certain volume without an increased cost in sales effort that nullifies the profit on this extra volume. On any type of merchandise this same thing is true to a degree. Continuing study should flag the danger points and possibly dictate a change in policy.

5. Orders

There is a very important field for study in the determination of what constitutes a profitable order. It has been assumed that small orders are not profitable. Some large companies do not even post small orders as they feel that it would cost more to put the transaction through the regular routine than the money the order would bring in. And yet a small order for stock merchandise may be directly profitable if sold through mail solicitation or possibly even if sold by a salesman; it may be indirectly profitable on the theory that many a tall oak has grown from a very small acorn. Certainly it pays to analyze and find out if there is such a thing as a profitable small order.

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[7] The Moline Plow Co. in 1923 was capitalized at $33,350,000. In 1925 most of the interests of the Moline Plow Co. were taken over by the Moline Implement Co. The Moline Implement Co. is capitalized at $2,968,000. A recent magazine article stated the profits of the organization under the smaller capitalization to be much better than under the larger and the business to be much sounder generally.

B. Planning the Work to be Done

Just as in manufacturing, planning plays an important part in sales operation. Sales planning must set up an organization of regional representation, of personnel, and of customer relationships; and devise methods of actual operation which will yield the best results.

Any organization that plans to distribute its merchandise on anything other than a local basis must set up some sort of regional representation. The task of selecting the one best suited to a particular organization falls to planning.

A force of salesmen has to be built and rebuilt and an adequate training program for the whole sales organization must be devised. Planning must seek to co-ordinate sales personnel with the rest of the company personnel so that all the organization becomes a team rather than a loose structure made up of jangling parts. The outstanding fact is that the matter of sales personnel cannot be left to chance. Salesmen are not just born nor do good salesmen naturally flock together. Sales planning must find ways of obtaining good salesmen and fitting them together into an adequate organization.

Planning must seek the kind of customer relationship which will give the greatest return in sales. There are the recognized channels of distribution (1) of selling directly to consumers, (2) of selling to dealers, (3) of selling to jobbers, (4) of selling through mail orders, and (5) of manufacturers conducting a chain of stores of their own. Planning must decide which of these either alone or in any combination offers the best opportunity. In our own case we use them all, and while certain complications naturally arise from this fact, nevertheless by and large, it is our experience that each one tends to build up the other.

The credit policy which sales planning must study is far-reaching in its effects. Salesmen are eager for new accounts, and to sell large orders to old accounts. Credit caution demands that the possibility of bad accounts be kept to a minimum. Provision must also be made for the follow-up of all customers to see whether the terms of sale are being observed. We have found in our own company that a very effective method of keeping eagerness for sales within reasonable bounds and on the other hand of keeping credit restrictions from being too stringent, is to put a high sales executive and a high credit executive and the treasurer of the company on a committee holding frequent meetings to go over the puzzling cases and so define policy more and more sharply.

Another problem of sales planning, that of proper times of delivery in given market conditions, is a combination of merchandising and of factory control as well as sales planning. Sales planning can register customer demands for delivery to guide the merchandiser in co-ordinating factory production and market demands. This co-ordination was described under the heading Merchandising.

As a further part of sales planning, it is just as necessary for a sales force to estimate what it can do in the way of sales and set up this estimate in a budget form, as it is for machine and credit requirements to be so budgeted. Sales budgeting works two ways. Starting with the individual salesman and running up through whatever other units of selling exist, each makes an estimate of what the next year's results will show. Then when all these estimates are reconciled by some control agency in terms of the whole business, the whole is broken down into precisely the same units as the estimates came from originally. Thus a task in volume properly balanced between optimism and pessimism is set and made directly applicable down to the final selling units.

A good many years ago it was found that the careless routing of the material which flows through a factory was a costly bit of poor managing. The same truth applies with equal force to the routing of salesmen. To avoid unnecessary travel but to assure that there shall be the proper amount of travel; to see to it that the traveling is to the most desirable places and to avoid duplication of traveling all are fundamental pieces of sales operation that sales planning must study. This too is closely hooked up with scheduling. If it be important that a salesman go to the right places, it is equally important that he shall go at the right times and the proper number of times. Furthermore it is necessary that within his job, the salesman shall devote proper amounts of time to actual selling, and to what is called missionary work or development work. The salesman can no more effectively work these problems out for himself than can the individual workman schedule the flow of work coming to his machine. Sales planning has a scheduling function which parallels production scheduling almost exactly.

One test of good planning and indeed of all management is the building up and maintenance of the proper amounts and kinds of records. It is a very easy matter to err on either side of this question. It is not an easy question to answer, but certainly sales planning like all planning must study it continuously and painstakingly.

C. Functionalization

The possibility of some degree of functionalization is the third element of scientific management practice that may be applied to the selling field. The job of selling must be thoroughly analyzed as a first step. F. W. Taylor made this same sort of analysis of the position of foremanship in manufacturing. He found that really to perform the foremanship task as it existed called for a combination of qualities that either could not be found combined in one person, or if there were such a person would certainly warrant a position at the very head of the organization. He found further that certain parts of the foreman's job could be regarded as separate functions. These functions were sufficiently simple that they did not call for impossible combinations of human qualities to handle adequately.

The job of selling can also be subject to searching analysis. It will develop that there are different kinds of selling jobs and that there are radically different parts to the whole job which is now given to salesmen. The short of the matter is that salesmanship stands today just where foremanship stood in the 1880's. Analysis, unbound by custom and tradition, will show that some salesmen sell established customers well but do a very poor job of digging out new prospects, or of working over prospects into customers; while other salesmen do the scouting and missionary work better than the steady contact work with old customers. It will be surprising if the next few years do not show some interesting experiments in dividing up a sales force. Most of the salesmen will have a definite list of customers which they are to cover on a moderately flexible time schedule; others will cover wider territories, selling little but marking out the field for subsequent working of a small body of especially qualified salesmen.

It is certain that much of the clerical work and figuring now done by salesmen in the field can be better done by centralized clerical forces. Salesmen's material can be better and more cheaply prepared for them than is the case when it is sent out to them under the mistaken notion that because they do it in the evening it doesn't cost the company anything.

We expect also in sales management to see a similar growth of functionalizing, already started by the separation of merchandising from the sales management job. The education of salesmen, their equipment, their routing, lend themselves in larger organizations at any rate to specialized studies which are to be put together in co-ordination by the sales managers.

Men in charge of sales departments can without question make fruitful use of a study of the trend of experience in the organization of staff and line functions in factories,—if they can study this freed from the deadening thought that because the two jobs of selling and manufacturing are different the one can learn nothing from the other. There are basic similarities.

ONE reason why no more success has attended the efforts of those who have attemped to build a system of scientific marketing is that they have put their faith in methods and men, and not in principles. The most successful scientific production methods will fail if imposed upon the company's marketing activities in unmodified form. The principles, however are just as good for one activity as for another, and, if they are properly carried out, success will be sure to follow.

The rise of the most successful business men is dependent upon adherence to certain universal principles. It may be possible to proceed against the current for a time, but ultimately these guiding truths, which have become established through thousands of experiences, will prevail. It may be observed that this is another way of saying that theories are the means whereby success is attained. (Percival White, *Scientific Marketing Management*, p. 95.)

Manufacturers' Marketing Survey

Reported and Discussed at a Meeting of the Taylor Society

New York, Decemder 10th, 1927

This survey is not, and was not intended to be, a sample of American industry; it is a sample of that group of concerns which are by repute most progressive in marketing. Of the 275 questionnaires which were sent out, seventy-nine were returned in time for inclusion in the preliminary analysis which follows.

The analysis shows clearly that the distinction between merchandising and selling, in organization and in detail procedures, is becoming a dominant characteristic of marketing among most progressive concerns. In this connection it is interesting to note that the seven per cent giving negative replies to both questions A 1 and A 2 are manufacturers of machinery and other producers' goods as distinguished from consumers' goods.

A comparison of these returns with the returns to a questionnaire addressed to a similar though smaller group of firms in 1920 (BULLETIN OF THE TAYLOR SOCIETY, Vol. V, No. 6, December, 1920) is interesting, although the two are not comparable in detail. The earlier questionnaire made a distinction between Sales Administration, Sales Engineering and Sales Operating. At the earlier date about half of those replying stated that they were working towards co-ordination of sales, production and finance; a concept corresponding only roughly to Merchandising in the present questionnaire. With respect to Sales Planning, as distinguished from Selling, in the earlier questionnaire some eighty-five per cent recognized the principle, but only fifty-five per cent in more or less developed practice.

With respect to the present questionnaire it is evident that in seven years there has been a development in concepts such as Merchandising, as distinct from Selling, and in supporting practical procedures, that there is established a common basis for study and discussion of "whys" and "hows." [Editor]

Definitions

Merchandising: A function which comprises co-ordination of the sale and the manufacture of goods to be sold; determination of varieties, qualities and quantities of items; determination of markets and trade channels; determination of list prices.

Selling: A function which comprises arrangement of territories; the selection, training, direction and supervision of salesmen; the arrangement and carrying out of sales campaigns.

Questionnaire

Organization

	YES Per cent	NO Per cent
A 1. Do you in your organization structure recognize a distinction between merchandising and selling?..	63	37

	YES Per cent	NO Per cent
A 2. If you do not recognize such a distinction in your organization structure, do you recognize it in your practice?	80	20
This question applies to the thirty-seven per cent who answered "No" to question A 1. The proportion of those who recognize the distinction either in organization or practice to those who recognize it neither in organization nor practice is	93	7

Merchandising

	YES Per cent	NO Per cent
B 1. Do you have in your organization a unit or an individual whose special function is to study merchandise relative to—		
a. Tendency towards obsolescence of standard items	61	39
b. New uses for standard items	57	43
c. Creation of new items	69	31
d. Determination of list price of items	63	27
Of those replying, forty-nine per cent answered "Yes" to all subdivisions; twenty-seven per cent answered "No" to all.		
B 2. If you do not have such a special unit or individual as is specified in the preceding question, does some unit or individual in your organization give a definite continuing amount of time to such studies?	89	11
Combining B 1 and B 2 the proportion of those who do to those who do not give attention to merchandising is	95	5
B 3. Do you have in your organization a unit or an individual whose special function is to study markets relative to—		
a. The amount of production of the several items necessary to meet the market requirements at different seasons and periods?	59	41
b. Control of inventories of finished product?	65	35
B 4. If you do not have such a special unit or individual as is specified in the above question, does some unit or individual give currently an appreciable amount of time to such studies?	88	12
The replies analyzed are the "No" replies to B 3		
B 5. Whether or not you make such studies as are indicated in the above questions, do you prepare periodic budgets or forecasted schedules of sales for definite periods in advance, as follows—		
a. General schedules?	94	6
b. By territorial divisions?	77	23
c. By items?	75	25
d. By classes of trade?	36	64
B 6. If you prepare such schedules, are they subject to continuing revision in the light of sales experience as a period develops?	82	18

Selling

	YES Per cent	NO Per cent
C 1. Do you have any special provision for selection of salesmen—tests or other devices?	38	62
C 2. Do you have any provision for the special training of salesmen?	68	32
C 3. Do you make continuing or special studies of sales territories as a basis of assignments to salesmen?	78	22
C 4. On what basis are salesmen paid?		
a. Straight salary	33	
b. Salary and bonus	21	
c. Straight commission	21	
d. Salary and commission	13	
e. Drawing account against commission	9	
f. Salary, commission and bonus	3	
C 5. Do you have any method of "rating" salesmen's ability	59	41
C 6. Do you have in your sales department a unit corresponding in principle to the "planning room" of a production department, which—		
a. Schedules salesmen?	50	50
b. Prepares material for salesmen?	78	22
c. Prepares information for salesmen?	84	16
d. Checks progress of sales—		
1. by territorial units?	89	11
2. by salesmen?	84	16
3. by items or classes of items?	81	19

A large number of "Noes" to D 1, D 2, and D 3 is from the same companies

	YES Per cent	NO Per cent
C 7. Do you establish sales quotas?		
a. Based on past sales?	78	22
b. Built up on forecasted market possibilities?	76	24
c. By salesmen?	66	34
d. By territorial divisions?	82	18
e. By individual products or items?	69	31

General

D 1. What are the two or three outstanding new and apparently permanent problems of marketing management which have come to you during the past eight years?

Listed in approximate order of frequency:

1. Hand to mouth buying.
2. Selection, training, and supervision of salesmen.
3. Newer methods of distribution.
4. Reduction of distribution costs.
5. Advertising.
6. Sales Research.
7. Competition (price cutting, cheaper lines, substition, foreign, etc.)
8. Chain stores, co-operatives, and syndicate buying groups.
9. Market analysis.
10. Change in style, demand, etc.
11. Organization of retail outlets, and overcoming the ignorance of the retailer.
12. Use of nationally advertised brands by retailers as "loss leaders."
13. Establishment of sales quotas.
14. Special to particular industries. (Used cars, prison-made goods, etc.)
15. Sales budgeting.
16. Scientific determination of selling costs.
17. Operation in buyer's instead of seller's market.
18. Filling out lines to smooth production and sales curves.
19. Quicker obsolescence.
20. Adaptation of product and package to suit tastes of consumer.
21. Interest of wholesalers in their own private brands.
22. To increase the efficiency of the wholesale point.
23. Multiplicity of numbers exactly alike.
24. Increased demand on manufacturers for special orders and immediate service.
25. Planning of merchandise to anticipate seasonal demand.
26. Location of stocks.
27. Increased production.

THE BUSINESS MAN of the future must become more and more a master of the sort of prophecy that straight and impersonal thinking makes possible. It means that the business man must apply scientific thinking to his problem. By scientific thinking I mean the sort of thinking that judges by results; that judges on the basis of facts instead of hopes, wishes, dreams, prejudices, or conventions . . . If we refuse to improvise, to guess, and to gamble, and force ourselves to think clearly from cause to effect, we shall see that whatever is going to happen in business and industry during the next ten or twenty years is really here now—if we only take the trouble to see it. When we business men are taken by surprise at some turn of affairs that upsets our calculations, we are too likely to say, "Now, who'd have thought that possible?" So many unprecedented things are going to happen in the next decade or so that it behooves us to get into the habit of thinking ahead and of saying, when we are surprised, only, "Now, what factor did I overlook in my planning?" There is a French phrase which runs: *Voir; Prevoir; Pourvoir,* which, freely translated, means "see to foresee; foresee in order to provide." This is a motto that we business men would do well to keep conspicuously on our desks during the years of change and readjustment that lie just ahead. (Edward A. Filene, *The Way Out,* pp. 50-52.)

Standards[1]

Successful Development and Operation of Scientific Management Call for the Establishment and Maintenance of Standards

By H. K. HATHAWAY
Schlage Lock Company, San Francisco

(Continued from October number)

Standardization of Machines

THE MOST general lack of standards will be found in the speeds at which machines are operated. In a mill in which literally thousands of identical machines were engaged on exactly the same work, variations of over ten per cent were found in the speeds of line shafts driving different groups. In view of the fact that these were continuous process machines, the importance of the loss from this single source will be evident.

In a handkerchief factory, when we started to make time studies, preparatory to putting the operation of machine ironing on task and bonus, we found that the machine speeds varied sixty per cent between the lowest and the highest. With other conditions standardized the higher speed was found to be satisfactory. It was also found that no particular attention was paid to the pressure of the steam supplied for heating the machines and consequently it fluctuated over a wide range during the day with a corresponding fluctuation in the temperature; some of the machines were equipped with traps for removing any water from the steam and some were not. These did not seem to be matters of any importance while the work was being done on ordinary day work; some of the girls produced less than others, but that was regarded as inevitable; "some operators are good and some not so good" was the accepted explanation. After standardizing these conditions—as well as the preceding operation, that of dampening—the production was increased one hundred per cent, the operator's earnings increased one hundred and sixty per cent, while their work was made easier and more agreeable.

The studies and work required to accomplish this extended over a period of more than six months. They involved the determination of laws governing the absorption and evaporation of moisture by each of the wide variety of fabrics from which handkerchiefs are made, the development of a special machine for controlling the amount of water supplied to the handkerchiefs, and of a "damp closet" in which they were stored to permit even diffusion of the water by capillary attraction and to prevent excessive evaporation while stored at the machine waiting to be ironed. Figure 10 shows the machine for "dampening" and Figure 11 (pp. 502-3, October number) a standardized mangle or ironing machine with its "damp closet" and standard trucks for receiving the work as ironed and transporting it to the next operation.

In a paper box factory similar studies and the establishment of standards in connection with a board lining machine—i.e., a machine for covering pasteboard with white paper—resulted in increasing the output one hundred and fifty per cent and enabling two men to operate the machine instead of three, as well as in effecting a considerable saving in indirect labor cost.

This is one of the best examples of machine standardization resulting from real elementary time study made by a competent time-study man whose work ranks with the best. His report made at the time is worthy of careful attention for it shows the pains and perseverance called for:

> On applying time study to the lining machine several changes were found necessary to get the machine into proper condition for applying the task and bonus. Formerly the procedure for loading the elevator of this machine, which rested about six inches above the floor at its lowest point, was to bring a load of board to the elevator and then repile it on the elevator. We have sunk the feeding elevator of this machine into the floor on a level with the floor, so that a Cowan platform of loaded board can be rolled right on to the elevator with a Cowan truck.
>
> Time study showed that the manner in which a roll of paper was made ready for the job being run on the lining machine was wrong, it being done as follows:

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[1] Paper presented before a meeting of the Taylor Society, New York, December 6, 1919, and reprinted from the Bulletin of the Taylor Society, Vol. V, No. 1, February, 1920.

There was a shaft with square-faced cones. The object of these square-faced cones was to drive the corners into the wooden cores of the paper rolls, but as our paper here has not come with wooden cores for the last few years past, it has been found that these square cones from the constant driving into the iron cores, which are now supplied in the rolls of paper, have worn the corners off from these square cones, so that the man making the roll of paper ready has to drive wooden wedges in to secure the rolls of paper tightly to the reel shaft. There was also an inadequate friction brake on the end of the shaft, held together by means of a carpenter's C clamp in order to get the proper tension required to pull this paper smoothly over the paste rolls.

It was deemed advisable to have a new reel shaft made. This in turn suggested another idea, that of having two reel rods and always having the next roll of paper needed ready and resting on extra brackets, which were provided at this time to hold the next roll of paper to be used on the machine. It was the previous custom when the roll of paper ran out to stop the machine and all hands start to make the next roll of paper ready. At the present time, with the use of the new roll rods, the machine tender will make the next roll ready while the machine is running.

It has also been found necessary in connection with the raising of the rolls of paper on the machine, owing to the height between the top of the machine and the ceiling, to have a set of tongs made which will enable us to get a very short hitch with the tackle blocks on the roll of paper. Before, a rope sling was used, and by the time the roll had been drawn up into the machine there would be slack enough occasioned by the stretch of the rope sling so that the roll could not be pulled up high enough to get it on the bearings of the machine; so it was usually the custom to call four or five men in and all hands boost the roll up on to the bearings.

Another condition which showed up at this time was the fact that sometimes at the finish of an order there would be quite a sizeable roll of paper left on the machine, it being too heavy for the machine tender and move man to remove from the machine. It has been found necessary to provide another track on the ceiling directly over where this roll would be resting, to enable us to lift this roll off with the tackle block. We could not use the track that the next roll ready is raised by, because it is some two feet back of the center of the roll that is being used.

Time study on this machine has also shown that it is advisable, if the scheme is practical, to feed the sheets of board into the lining machine the narrow way of the sheet instead of the long way of the sheet. The gain in sheets (ranging approximately from ten per cent to fifty per cent) against each size of board run per minute is shown on report made relative to changing the sizes of lining paper. In order to accomplish this end it was found necessary to put a wider canvas on the lining machine, the width of the canvas then used being thirty-six inches. This width could not be used any longer, as the longest sheet of board that we would need to run in the machine would be thirty-eight inches. In order to get a canvas to accommodate these thirty-eight inch sheets, it was thought best to provide one the full face of the rolls, which is forty inches, and in doing this it meant that we had to reconstruct the guides which caused this canvas to run in the center of the machine and not traverse from side to side.

It was also found necessary in connection with the running of the sheets the opposite way in the machine to provide a new side gauge. This should have been done sometime ago, as the gauge that was on was in a dilapidated condition; and in order to feed these sheets into the machine the narrow way, it was necessary to bring the end roll next to the feeder back toward the feeder a distance of about eighteen inches, so that feeder could reach the feed-in canvas.

Having received the new width canvas and installed it on the machine, we decided to make a run of the five sizes of board that we could use, the longest rolls of lining paper that we had, to see what the effect would be on the board of running it the grain with the circumference of the rolls. We soon found out after starting this that the sheets came out of the machine badly curled, so much so that it was almost impossible to pile them, to say nothing of the trouble that might be occasioned at the scoring machines later on. Rather than discard the idea of running these sheets this way and returning to the old way, we raised the canvas coming off the last drier about two feet, running it over a four and one-half inch roll instead of a seven inch roll, and placing two iron rolls on the top of this one, thereby bending the board over a small diameter roll in the opposite direction from what the board is curled, coming from the large drier. This attachment is running at the present time, and the board is coming from the machine straighter than it did under the old system of running the sheets in the machine the old way; but it was found that in bringing the sheets down to the man breaking at the end of the machine vertical instead of coming out to him horizontally, it inconvenienced the breaker so that it has been decided to put an automatic cut-off on to this machine, most of the apparatus for which is on hand in the plant at the present time.

Another adjustment which was found necessary in connection with the operation of this machine was one which would raise the paper off from the paste roll when the machine would be stopped to reload the elevator. The previous custom was to break the paper off by hand after the load which was on the elevator had been run and then rethread the machine. This appliance is now on the machine, and shows a saving of one-half the time.

The conclusions to be drawn from this report are as follows:

The second track to go on the ceiling has arrived but has not been put in place. The inside gauge is being made at the Chapel Machine Shops. New tongs for lifting the paper rolls are forged up and in the machine shop. New reel rods are made and are in use. The elevator has been lowered even with the floor to receive the Cowan truck load of board. A new canvas is running on the machine at the present time.

As soon as the rest of the alterations are made on this machine and the new sizes of lining paper have arrived, there is no reason why the task and bonus cannot be immediately applied.

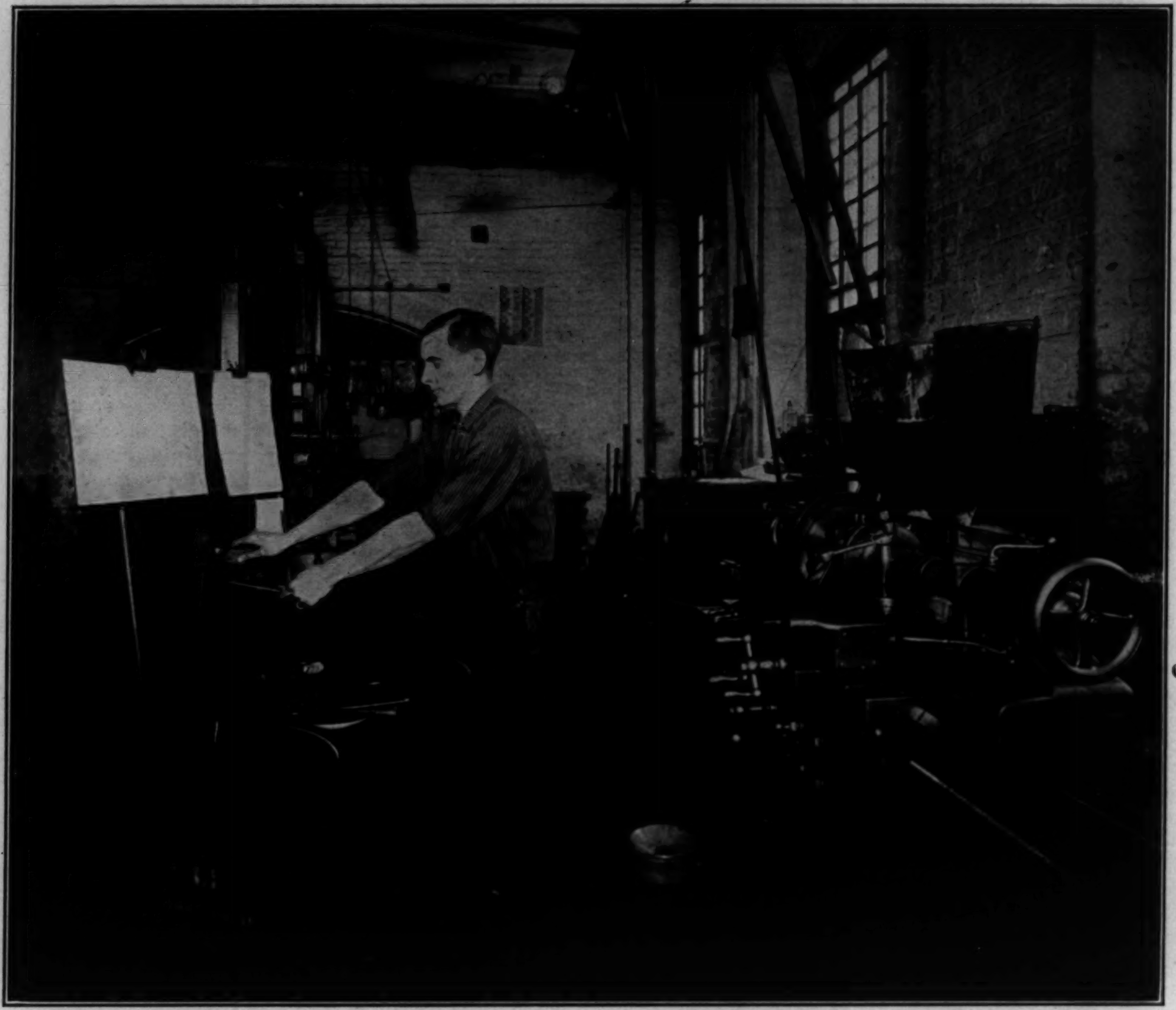

Figure 13
Tool Stand, with height gauge and packing piece racks and rack for holding drawing and instruction card for work in progress.

Any one of the examples cited above would in itself furnish the substance for a paper.

Machine shop practice affords a rich field for machine standardization and in this field Mr. Barth's work is pre-eminent.

Two machine tools of the same size and presumably of the same capacity built by different makers will be found to vary greatly in the range of speeds and feeds provided and in pulling power. It is highly desirable—more obviously so under scientific management—that they should be the same, or as nearly so as possible, in order that jobs may be routed to either one indiscriminately and done as efficiently in one as the other, the same instruction cards and the same tool lists serving either one. By judicious and inexpensive changes in pulleys, belts and gears, Mr. Barth not only brings this about, but what is of greater importance, provides a range of speeds, of feeds and of pulling power suited to the predominating product, taking into account size, material and kind of work, in place of the combination provided

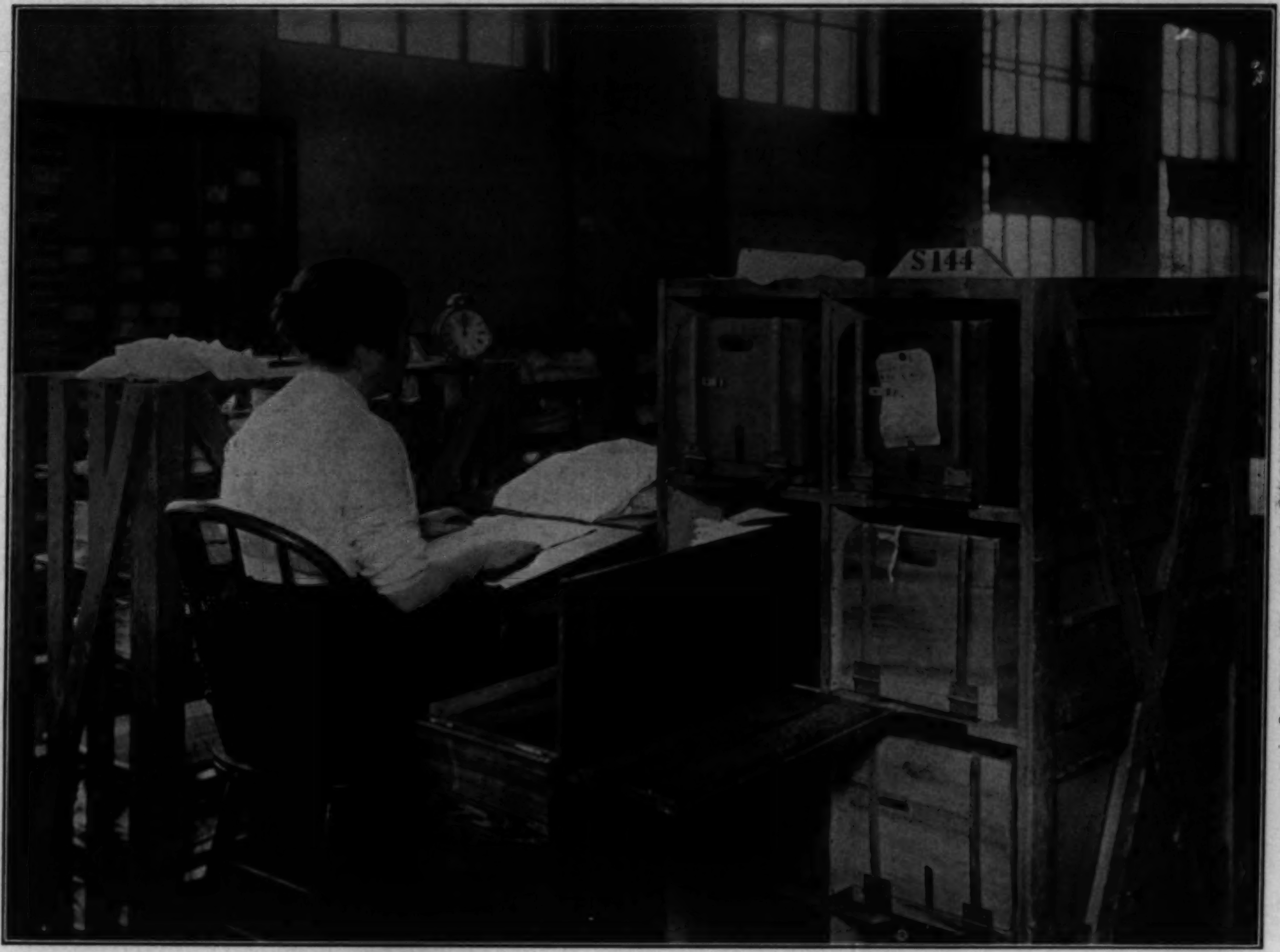

Figure 14
Standard Work-Place, Trucks and Containers for Folding Handkerchiefs.

by the maker which aimed to provide for *everything* within the machine's capacity, from the largest to the smallest. For example in a twenty-four inch engine lathe one may turn a piece twenty-four inches in diameter or one-half inch in diameter, but it is not good practice to do either; therefore, why try to provide speeds suitable for these extremes at the expense of speeds for the range of diameters that should properly and will as a rule be handled in a machine of that size?

Bolt slots for clamping work on the tables of drill presses, milling machines and boring mills and on the face plates of lathes seem to have been a detail considered of little importance by machine designers. Two different machines built by the same maker will be found to take bolts of the same diameter but with heads of a different size; two machines of the same kind and size built by different makers will be found to call for bolts different in diameter as well as in the dimensions of the heads. I have even seen a drill press with slots provided to take bolts three-quarters of an inch in diameter, but a different size head in the table from that provided for in the base plate.

From what I have said about bolts under the head of standard tools, I think you will appreciate the difficulties, the loss of time and of production which such an unstandardized condition entails. Even supposing that a supply of ordinary bolts for each machine were kept in the tool room, resulting in a much larger stock and more work in the tool room, that they were kept in first-class con-

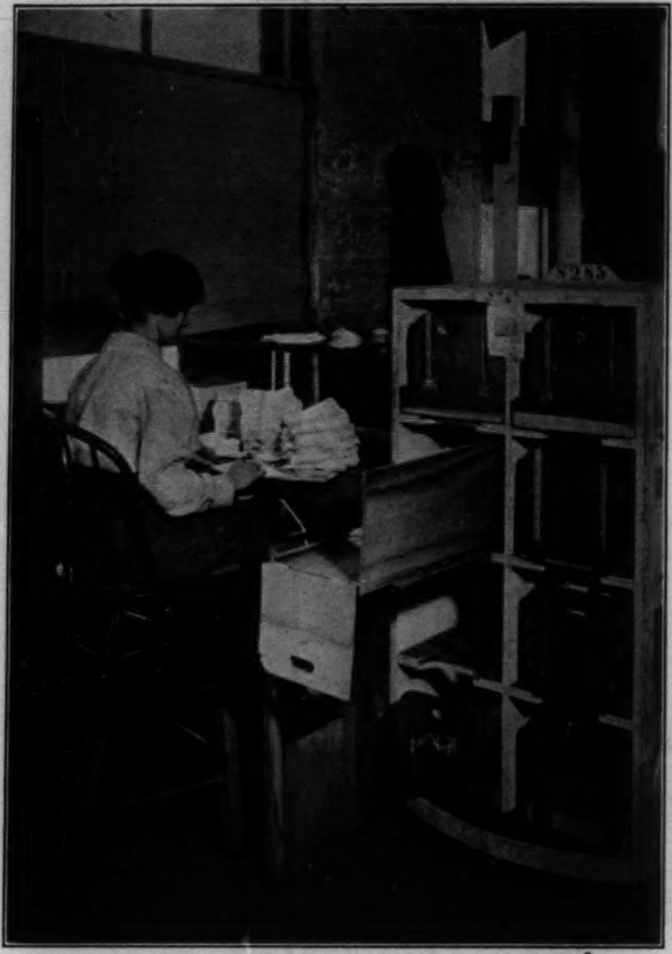

Figure 15
Standard Work Place for "Ribboning" Handkerchiefs. Note the "Spring Chair" developed by Frank B. Gilbreth. The legs rest on springs in the extensions to eliminate floor vibration and any consequent discomfort or fatigue.

dition and issued to the machines as required in advance for each job, we would nevertheless find that owing to the poor proportions of the head they would frequently break or damage the slots on the table.

On this account it is the practice as one of the preliminary steps in installing the Taylor System in a machine shop to plane out the slots in all machines to take the strong standard bolt developed by Mr. Barth.

Still another excellent and simple illustration of machine standardization in a machine shop is in the tool posts of small and medium size engine lathes. Until quite recently and still in many instances, the tool post with its concave or cupped washer and sliding shoe furnished with the machine was intended to be used with a tool simply cut off from the bar of steel, the end trimmed roughly to shape and ground. Now the Taylor standard tool, as will be seen by referring back to Figure 7, (p. 500, October number) has a nose turned up considerably above the top surface of the bar, facilitating grinding and affording an increased number of grindings before the tool must be dressed, with, as a consequence, less waste of tool steel. In all cases where necessary the tool post and in some cases the side rest are altered to permit the use of standard tools; usually this results in reducing the number of sizes of tool steel that have to be used. A more direct gain is obtained, however, by doing away with the cupped washer and sliding shoe and substituting therefor a flat washer with flat pucking pieces to be placed under the tool.

To make this clear it is necessary that I explain that the cutting edge of a tool used on cylindrical work be set approximately on, or slightly above, the horizontal radial axis of the work and that the front of the tool clear slightly a tangential line drawn from the point at which the edge of the tool touches the work. The front of a Taylor Standard tool is ground to an angle of six degrees from a perpendicular to the base, just enough so that the front of the tool will bear on the work only on the cutting edge; consequently it should be set with the cutting edge just on the horizontal axis of the work—"on the center," as a machinist would say. If a tool is ground with a greater angle of clearance—as is almost inevitable with a tool ground by hand on an emery wheel of relatively small diameter (and it is not unusual to see such tools ground with from fifteen to twenty degrees clearance)—one of two things must be done. Either it must be set with the cutting edge above the center or horizontal axis of the job so that the circumferential arc of the work will neutralize the excessive clearance, or it must tilted, the base being on an angle to the horizontal, which accomplishes the same effect. The cupped washer and sliding shoe accomplishes both at once, tilting the tool and raising the edge. It is in fact quite an ingenious device. However, there is one very serious objection to it; the proper setting of the tool is a matter of judgment and of cut and try, calling for more skill and better judgment than is possessed by many workmen and very liable to be

Figure 16
Truck Station.

a source of delay, or at least uncertainty in the time of an important element.

All of this uncertainty is eliminated by the flat washer and packing pieces replacing the cupped washer and sliding shoe, and by the provision of a measuring device which quickly indicates the number and thickness of packing pieces that must be placed under the tool, to compensate for variation in height from base to cutting edge due to grinding, and to bring the cutting edge in contact with the work at the right point. This is another standard for which we are chiefly indebted to Mr. Barth.

Under the unstandardized conditions described it is impossible to make a definite allowance for this elementary operation which on the average must be performed several times during each job. Under the standardized conditions it not only may be depended upon to take the same time each time it is done, but it may be done in less time. A description of this device, of which there are several forms all essentially the same, is, I think, worth while, as it may suggest something similar in other directions. The measuring device with hooks, holding packing pieces, shown by Figure 9 (p. 501, October number), is mounted on the tool stand supplied for the lathe. The tool is picked up from the stand and placed on its base with the cutting edge against the scale. The graduation indicates by direct reading the packing pieces or pieces required, which are picked off their hooks and placed with the tool in the tool post. If the cutting edge comes to the top graduation—marked *O*—as might be

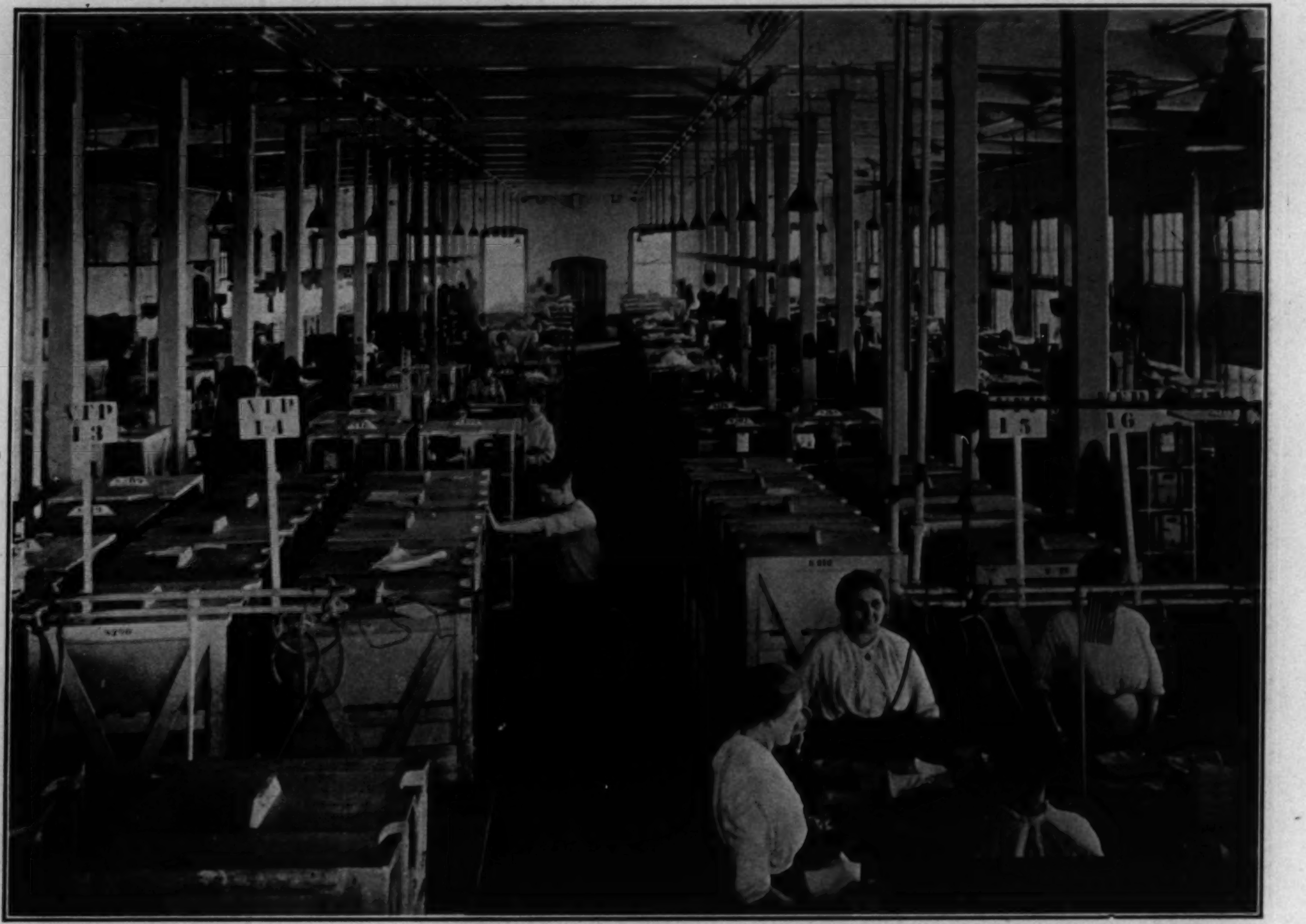

Figure 17

General View of Folding Department.

the case with a new tool, no packing is required. If it comes to line *A* packing piece *A* is required; if line *AB* packing pieces *A* and *B* are required.

The tool stand itself is an interesting example of standardization. It will be noted by reference to Figure 13 that it provides places for not only the tools for the job in process and jobs ahead but also for the drawings, instruction cards, etc. There is no uncertainty as to where they are and no time lost in finding them when wanted.

The establishment and maintenance of standards in connection with leather belts for transmitting power is an essential feature of machine standardization. It ought to be so well known and understood as to require no reference here. At any rate it would require more time and space than may be devoted to it. I would refer those who may desire complete information on the subject to the following literature:

"Notes on Belting," a paper presented at the December, 1893, meeting of the American Society of Mechanical Engineers, by F. W. Taylor.

"The Transmission of Power by Leather Belting," a paper presented January 12, 1909, at a meeting of the American Society of Mechanical Engineers, by Mr. Carl G. Barth. Attention is directed to the discussion of this paper by Mr. Walter C. Allen, by Mr. F. A. Waldron and by the writer, describing the practical application of the work of Mr. Taylor and Mr. Barth.

"A Practical Solution of the Belting Problem," a pamphlet issued by the Tabor Manufacturing Company, Philadelphia.

Standardization of Work Places and Facilities for Transporting and Storing Materials

In many industries "hand work" done at benches, tables or work places predominates. The standardization of equipment and conditions is of no less importance than in the case of work in the performance of which machines are employed. Figure 14, taken in the Lebanon, Pennsylvania, plant of Herrmann, Aukam & Company, manufacturers of handkerchiefs, is almost self explanatory. The individual work place for folding handkerchiefs is just the right size, height and slope of the top, permitting the operator to work equally well either sitting or standing and thus to vary the monotony, and there are two standard trucks, one on the left of the operator containing the handkerchiefs flat, in units of convenient size on the board as they come from the ironing machine, and one on the right to receive the handkerchiefs after being folded. I would call your attention to the special open-side container in the truck for finished work, drawn out and resting on a shelf attached to the "work place" at just the right height to receive the folded handkerchiefs and with the hinged end let down so as not to be in the way of the operator's arm. The weight of the units both before and after folding is designed to be such as to be easily handled by the operator and to afford a change from the monotony and fatigue of folding at sufficiently frequent intervals; having folded the handkerchiefs contained on a board and having filled a container, the operator places the container in one of the truck's compartments, puts an empty one in its place on the shelf and takes another unit of flat handkerchiefs from the truck on the left, placing it in position for folding. Regular rest periods are, however, also provided. The trucks are moved to and from the work place by "move men" in accordance with orders from the Planning Department.[3]

Contrast this condition, the result of exhaustive study and experiment, with what existed before when the equipment consisted of tables, about four feet wide, thirty feet long, the tops about twenty-four inches from the floor, running lengthwise across the factory with an aisle at either end. The operators sat on both sides of these tables, and a person to get through had to pass between the backs of the chairs of the operators. Work was delivered from ironing machines in an ordinary box truck, from which it was taken and stored on any unoccupied table space, in boxes under the tables, on chairs, or in any available floor space. It was "given out" to the operators by the forewoman in batches of from ten dozen to thirty-five dozen at a time—one-fourth to three-fourths of an hour's work; the operator leaving her work place, carrying her finished work to the forewoman's table and getting another job—an awkward arrangement owing to the congestion and to the small jobs given out, partly to equalize injustice or inaccuracy in piece rates by distributing "good work" and "bad work" to all, and partly because about twenty-five dozen was all a girl could conveniently carry and take care of at her work place. There were usually several girls changing jobs at the same time and consequently there was considerable loss of time and confusion. Naturally under such conditions and with a great variety of product there could be little control of the various lots or orders in progress, materials were damaged owing to poor methods of handling and storing while in progress, production was low and the operators dissatisfied.

As a result of the standardized conditions, of adequate planning and control, and of the establishment of task and bonus the average production on this operation was increased two hundred per cent, and the average earnings of the operators increased one hundred and thirty-six per cent. The operator in Figure 15 earned her bonus, completing each job in the time allowed on all but three jobs during eight months. Throughout the department the production reached an average between ninety and ninety-five per cent of that established as the standard of accomplishment. A typical weekly report showed that out of twenty-nine operators thirteen accomplished all of their jobs in the time allowed, six earned bonus on between ninety and ninety-six per cent of their work, four between eighty-three and eighty-six per cent, four between seventy-two and seventy-eight per cent, one sixty-two per cent and one forty-three.

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[3] The writer desires to give credit for work done previous to his connection with this undertaking to Major Frank B. Gilbreth, particularly in the development of individual "workplaces," means for handling ironed handkerchiefs in convenient units, and a standard method of folding. Credit should also be given Major M. C. Herrmann, Mr. Charles Hoffman and Capt. D. J. Walsh for the further development of these methods and means.

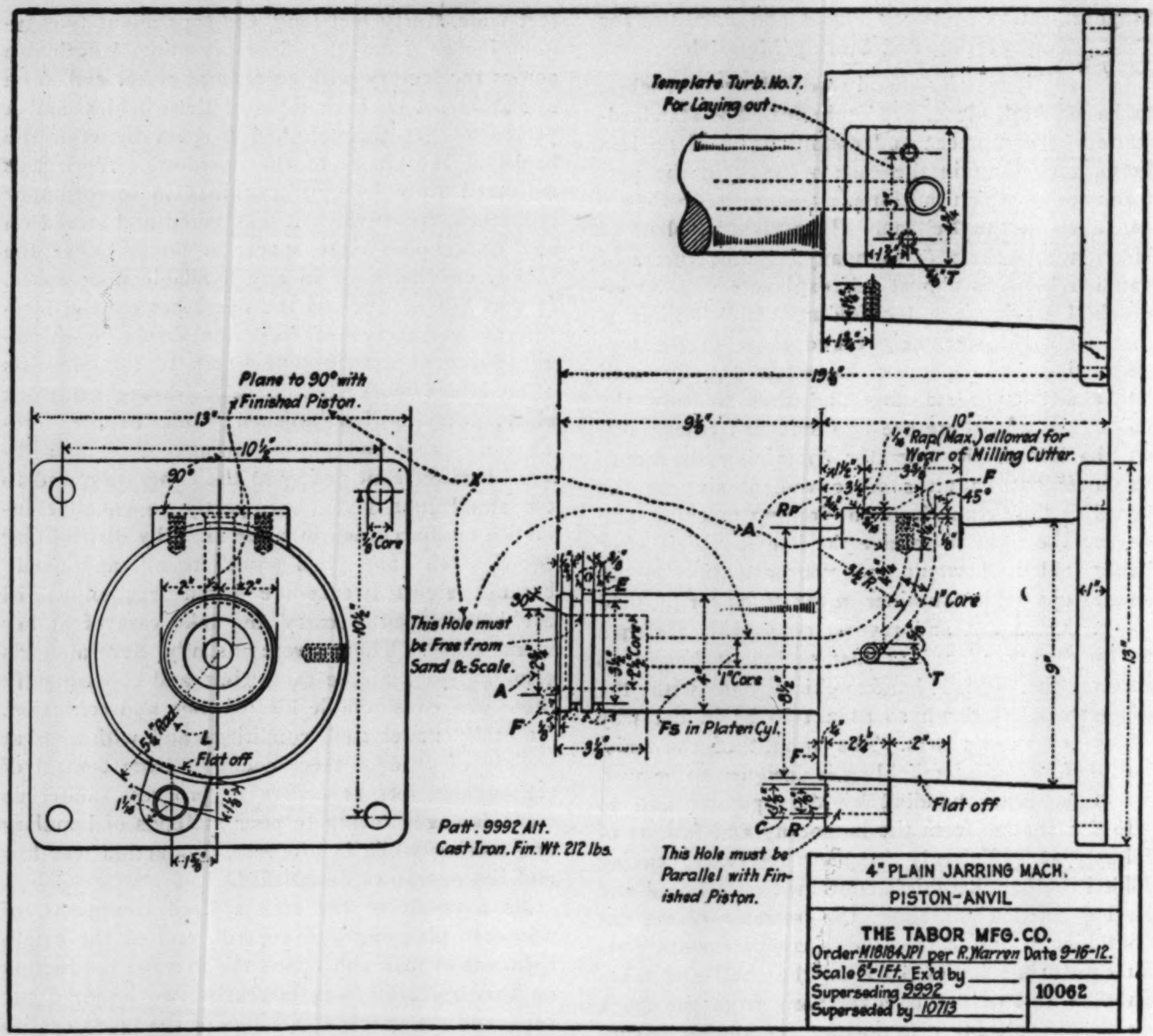
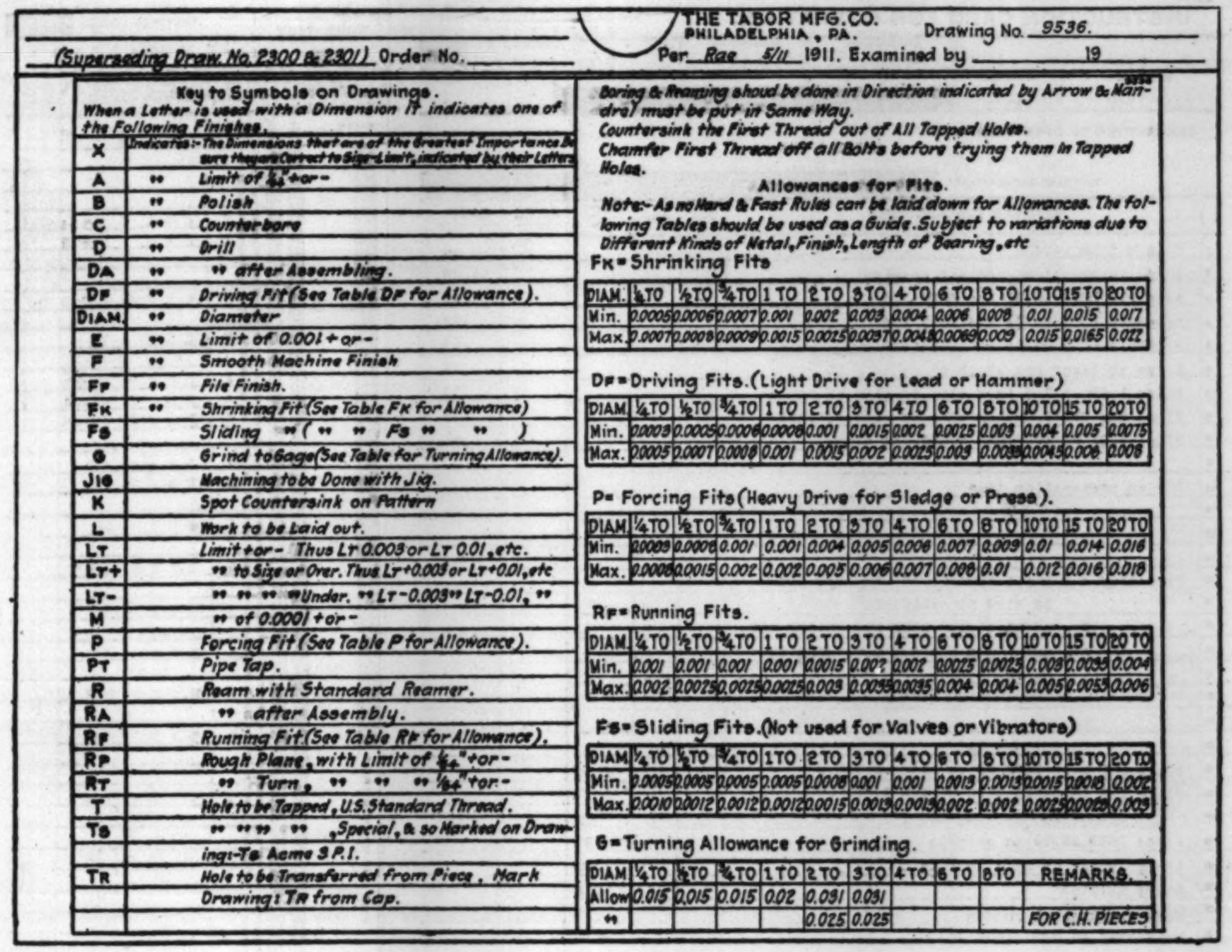


Figure 18
Drawing showing symbols and notes, indicating kind of finish, degree of accuracy, special tools to be used, etc.—nothing left to chance.

Similar standard work places were designed for each of the operations. Figure 15 shows one for "ribboning," i.e. tying the handkerchiefs on a card in attractive form before boxing. Figure 16 shows a truck station in which "jobs ahead" of the "ribboners" are stored and Figure 17 gives a general view of one department with a truck station in the foreground. The orderly arrangement with its ample and unobstructed aisles is in marked contrast to what existed before.

Standardized Materials

Standard materials which may be depended upon to react the same to treatment every time are essential to scientific management. Under the old style management fluctuations in output, due to variations in quality of material, are obscured. Under scientific management they are constantly forcing themselves upon the management's attention and demanding action.



THE TABOR MFG. CO.
PHILADELPHIA, PA.
Drawing No. 9536.
(Superseding Draw. No. 2300 & 2301) Order No.
Per Rae 5/11 1911. Examined by 19

Key to Symbols on Drawings.
When a Letter is used with a Dimension it indicates one of the Following Finishes.

X	Indicates:-	The Dimensions that are of the Greatest Importance Be sure they are Correct to Size-Limit, indicated by their Letters
A	"	Limit of 1/64" + or -
B	"	Polish
C	"	Counterbore
D	"	Drill
DA	"	" after Assembling.
DF	"	Driving Fit (See Table DF for Allowance).
DIAM.	"	Diameter
E	"	Limit of 0.001 + or -
F	"	Smooth Machine Finish
FF	"	File Finish.
FK	"	Shrinking Fit (See Table FK for Allowance)
FS		Sliding " (" " FS " ")
G		Grind to Gage (See Table for Turning Allowance).
JIG		Machining to be Done with Jig.
K		Spot Countersink on Pattern
L		Work to be Laid out.
LT		Limit + or - Thus LT 0.003 or LT 0.01, etc.
LT+		" to Size or Over. Thus LT+0.003 or LT+0.01, etc
LT-		" " " " Under. " LT-0.003 " LT-0.01, "
M		" of 0.0001 + or -
P		Forcing Fit (See Table P for Allowance).
PT		Pipe Tap.
R		Ream with Standard Reamer.
RA		" after Assembly.
RF		Running Fit (See Table RF for Allowance).
RP		Rough Plane, with Limit of 1/64" + or -
RT		" Turn, " " " 1/64" + or -
T		Hole to be Tapped, U.S. Standard Thread.
TS		" " " " , Special, & so Marked on Draw-
		ing:-TS Acme 3 P.I.
TR		Hole to be Transferred from Piece, Mark
		Drawing: TR from Cap.

Boring & Reaming shoud be done in Direction indicated by Arrow & Mandrel must be put in Same Way.
Countersink the First Thread out of All Tapped Holes.
Chamfer First Thread off all Bolts before trying them in Tapped Holes.

Allowances for Fits.

Note:- As no Hard & Fast Rules can be laid down for Allowances. The following Tables should be used as a Guide. Subject to variations due to Different Kinds of Metal, Finish, Length of Bearing, etc

FK = Shrinking Fits

DIAM.	1/4 TO	1/2 TO	3/4 TO	1 TO	2 TO	3 TO	4 TO	6 TO	8 TO	10 TO	15 TO	20 TO
Min.	0.0005	0.0006	0.0007	0.001	0.002	0.003	0.004	0.006	0.008	0.01	0.015	0.017
Max.	0.0007	0.0008	0.0009	0.0015	0.0025	0.0037	0.0045	0.0069	0.009	0.015	0.0165	0.022

DF = Driving Fits. (Light Drive for Lead or Hammer)

DIAM.	1/4 TO	1/2 TO	3/4 TO	1 TO	2 TO	3 TO	4 TO	6 TO	8 TO	10 TO	15 TO	20 TO
Min.	0.0003	0.0005	0.0006	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.004	0.005	0.0075
Max.	0.0005	0.0007	0.0008	0.001	0.0015	0.002	0.0025	0.003	0.0035	0.0045	0.006	0.008

P = Forcing Fits (Heavy Drive for Sledge or Press).

DIAM.	1/4 TO	1/2 TO	3/4 TO	1 TO	2 TO	3 TO	4 TO	6 TO	8 TO	10 TO	15 TO	20 TO
Min.	0.0003	0.0008	0.001	0.001	0.004	0.005	0.006	0.007	0.009	0.01	0.014	0.016
Max.	0.0008	0.0015	0.002	0.002	0.005	0.006	0.007	0.008	0.01	0.012	0.016	0.018

RF = Running Fits.

DIAM.	1/4 TO	1/2 TO	3/4 TO	1 TO	2 TO	3 TO	4 TO	6 TO	8 TO	10 TO	15 TO	20 TO
Min.	0.001	0.001	0.001	0.001	0.0015	0.002	0.002	0.0025	0.0025	0.003	0.0035	0.004
Max.	0.002	0.0025	0.0025	0.0025	0.003	0.0035	0.0035	0.004	0.004	0.005	0.0055	0.006

FS = Sliding Fits. (Not used for Valves or Vibrators)

DIAM.	1/4 TO	1/2 TO	3/4 TO	1 TO	2 TO	3 TO	4 TO	6 TO	8 TO	10 TO	15 TO	20 TO
Min.	0.0005	0.0005	0.0005	0.0005	0.0008	0.001	0.001	0.0013	0.0013	0.0015	0.0018	0.002
Max.	0.0010	0.0012	0.0012	0.0012	0.0015	0.0018	0.0015	0.002	0.002	0.0025	0.0025	0.003

G = Turning Allowance for Grinding.

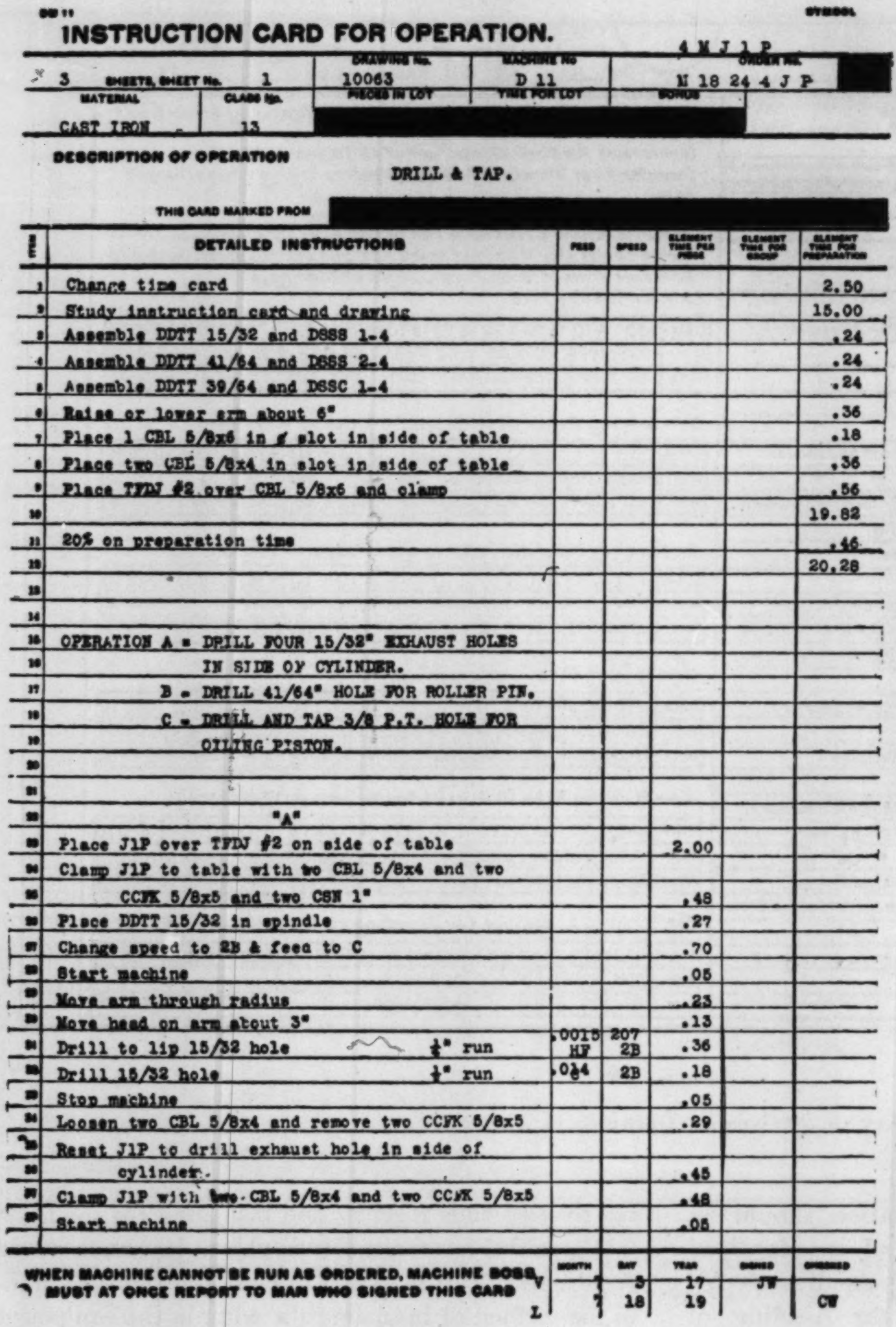
DIAM.	1/4 TO	1/2 TO	3/4 TO	1 TO	2 TO	3 TO	4 TO	6 TO	8 TO	REMARKS.
Allow	0.015	0.015	0.015	0.02	0.031	0.031				
"					0.025	0.025				FOR C.H. PIECES

Figure 19

Key to Symbols on Drawings of Figure 18.

But little in the way of illustration should be needed to show the importance of standardized materials. In the case of winding small coils for electric magnets, related under the heading of standardization of tools, our studies showed that an average of one-fifth of the operator's time was consumed repairing breaks in the wire due to defects. While it had been known to the operators that there was great loss here, it was not realized by the management until the facts were brought out by the time studies.

Each break necessitated the operator stopping her machine, retrieving the broken end of the wire on the spool, threading it through several guide pulleys, brazing the two ends together and insulating the joint. It was seen that to correct this trouble at its source would require months if not years of work, involving changes in the method of insulating the wire, in the equipment used for insulating and even in securing the co-operation of the manufacturer of the raw materials, by all of which it was ultimately reduced materially. As the number of breaks that might occur during a job could not be predicted, the expedient was adopted of setting the time for the job with no allowance for breaks included. If the time set for a job were to include the repairing of breaks, in order to insure fairness to the operator we should have had to allow time for the *greatest number of breaks that might*



INSTRUCTION CARD FOR OPERATION.

SYMBOL 4 M J 1 P

3 SHEETS, SHEET No. 1	DRAWING No. 10063	MACHINE No. D 11	ORDER No. N 18 24 4 J P	[redacted]
MATERIAL CAST IRON	CLASS No. 13	PIECES IN LOT [redacted]	TIME FOR LOT	BONUS

DESCRIPTION OF OPERATION

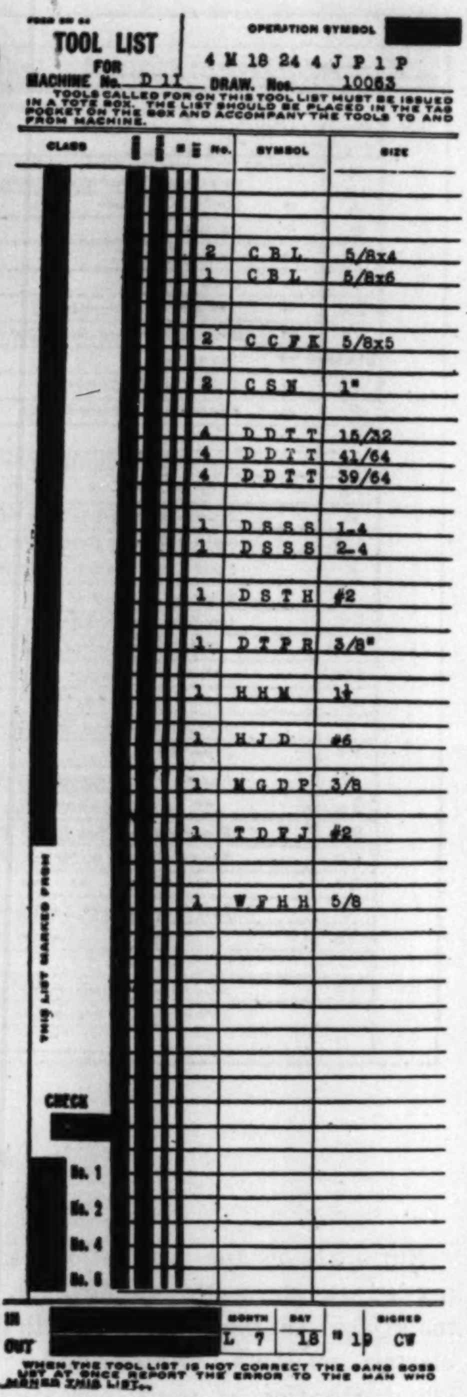
DRILL & TAP.

THIS CARD MARKED FROM [redacted]

ITEM	DETAILED INSTRUCTIONS	FEED	SPEED	ELEMENT TIME PER PIECE	ELEMENT TIME FOR GROUP	ELEMENT TIME FOR PREPARATION
1	Change time card					2.50
2	Study instruction card and drawing					15.00
3	Assemble DDTT 15/32 and DSSS 1-4					.24
4	Assemble DDTT 41/64 and DSSS 2-4					.24
5	Assemble DDTT 39/64 and DSSC 1-4					.24
6	Raise or lower arm about 6"					.36
7	Place 1 CBL 5/8x6 in g slot in side of table					.18
8	Place two CBL 5/8x4 in slot in side of table					.36
9	Place TFDJ #2 over CBL 5/8x6 and clamp					.56
10						19.82
11	20% on preparation time					.46
12						20.28
13						
14						
15	OPERATION A = DRILL FOUR 15/32" EXHAUST HOLES					
16	IN SIDE OF CYLINDER.					
17	B = DRILL 41/64" HOLE FOR ROLLER PIN.					
18	C = DRILL AND TAP 3/8 P.T. HOLE FOR					
19	OILING PISTON.					
20						
21						
22	"A"					
23	Place J1P over TFDJ #2 on side of table			2.00		
24	Clamp J1P to table with two CBL 5/8x4 and two					
25	CCFK 5/8x5 and two CSN 1"			.48		
26	Place DDTT 15/32 in spindle			.27		
27	Change speed to 2B & feed to C			.70		
28	Start machine			.05		
29	Move arm through radius			.23		
30	Move head on arm about 3"			.13		
31	Drill to lip 15/32 hole ¼" run	.0015 HF	207 2B	.36		
32	Drill 15/32 hole ½" run	.014	2B	.18		
33	Stop machine			.05		
34	Loosen two CBL 5/8x4 and remove two CCFK 5/8x5			.29		
35	Reset J1P to drill exhaust hole in side of					
36	cylinder.			.45		
37	Clamp J1P with two CBL 5/8x4 and two CCFK 5/8x5			.48		
38	Start machine			.05		

WHEN MACHINE CANNOT BE RUN AS ORDERED, MACHINE BOSS MUST AT ONCE REPORT TO MAN WHO SIGNED THIS CARD	MONTH	DAY	YEAR	SIGNED	CHECKED
V	7	3	17	JW	
L	7	18	19		CW

Figure 20
Standard Method Instruction Card.



TOOL LIST FOR MACHINE No. D 11

OPERATION SYMBOL [redacted]

4 M 18 24 4 J P 1 P

DRAW. Nos. 10063

TOOLS CALLED FOR ON THIS TOOL LIST MUST BE ISSUED IN A TOTE BOX. THE LIST SHOULD BE PLACED IN THE TAG POCKET ON THE BOX AND ACCOMPANY THE TOOLS TO AND FROM MACHINE.

CLASS	No.	SYMBOL	SIZE
	2	C B L	5/8x4
	1	C B L	5/8x6
	2	C C F K	5/8x5
	2	C S N	1"
	4	D D T T	15/32
	4	D D T T	41/64
	4	D D T T	39/64
	1	D S S S	1-4
	1	D S S S	2-4
	1	D S T H	#2
	1	D T P R	3/8"
	1	H H M	1¼
	1	H J D	#6
	1	M G D P	3/8
	1	T D F J	#2
	1	W F H H	5/8

THIS LIST MARKED FROM

CHECK

No. 1
No. 2
No. 4
No. 6

		MONTH	DAY		SIGNED
IN	[redacted]				
OUT	[redacted]	L 7	18	19	CW

WHEN THE TOOL LIST IS NOT CORRECT THE GANG BOSS MUST AT ONCE REPORT THE ERROR TO THE MAN WHO MARKED THIS LIST.

Figure 21
Tool List for Instruction Card.

occur. This would obviously be too high in the majority of cases. We therefore provided a small printed form for each job on which the operator made a mark each time a break occurred. This slip was turned in by the operator with her time card, and extra time added to each job in accordance with the actual number of breaks.

An interesting commentary on the relations existing between the employes and employers in this plant, and upon the accuracy of the time studies and fairness of the task based thereon, lies in the fact that no evidence was found of any effort on the part of the operators to report more breaks than were actually encountered. Incidentally, I should add that, pending relief from efforts to standardize the wire, the time required to repair breaks was reduced through standardization of tools and machines and improvement of methods.

In machine shop practice the feed, speed and number of cuts are predetermined for each job, and on this basis the cutting time and the time for changing tools is computed. Whether the time set is right or not depends upon the material being standard with respect to hardness and the amount of metal to be removed. If there is any appreciable variation from standard the tool will become dull and have to be replaced before completing the work it should have done; and the speed, feed, or both, will have to be reduced or extra cuts taken, and one or more tools may have to be procured from the tool room. The result is that the job cannot be done in the time set, through no fault of the workman, and extra time must be allowed.

Standards of materials and standards of quality of work done are, after the performance of the first operation, in a sequence almost inseparable. Frequently unless one operation is correctly performed the succeeding ones may not be done in the time allowed or in accordance with the standard method; accurate information as to the quality required, the tolerances or degree of accuracy, the kind of finish, etc., must be supplied in the form of samples, specifications or drawings. Such information is required not only by those who plan the work but also by the operator, the inspector and other functional foremen in the shop. In a machine shop run under the Taylor System not only are detail drawings furnished for each piece and assembled unit, but they contain information, more explicitly and clearly given than is ordinary practice, which by answering all questions in advance, avoids errors or misunderstandings, and saves the time of foremen and workmen seeking information from the draughting room or other sources, etc. The character of this information is shown by Figures 18 and 19.

Standard Processes or Methods

Standard conditions with respect to machinery, tools, other equipment and materials are prerequisite to standard processes or methods, and as a matter of fact, once they have been established in a large measure *standard methods result as a natural consequence.*

There are often several ways of doing a job—but usually only one best way. It is mainly for the purpose of insuring the one best way, making the fullest use of and adherence to the standard conditions established, that work is carefully planned in advance, that route charts and route sheets are prepared, and that detailed instruction cards and tool lists are provided for each operation. In this way we largely overcome the inequalities of experience in various workers who may be called upon at different times to do the same job, and insure that successive operations shall be performed in the most economical sequence. Under the old system of management, John Smith, for example, is an old hand who knows the product and the shop's equipment; he has always done a certain job and has evolved what under the circumstances is the best way—or at least a very good way—of doing it; owing to some circumstance, the next time that the job has to be done John Smith is absent, and it is given to a new man, with the result that he starts in about where John Smith did when he first tackled the job.

In a foundry doing a large variety of work certain large and expensive castings had to be made. It was a rather difficult job, and at first a number of castings were lost while it was being found out how to overcome the difficulties. No record was made, however, of the method developed. Several months later the same job had to be repeated and as both the molder who made it and the foreman had to contend with many other problems in the interval, their recollection of the method arrived at the first time was hazy; the result was that they had to again go over the same ground with its attendant losses.

Standard methods clearly defined by instruction cards based upon the composite best experience of the shop or the industry plus the results of scientific investigation and experiment, not only are a safeguard against such conditions as those cited in the foregoing typical instances, but they serve another equally important end; that of a check against any failure to maintain the standards of equipment, materials or conditions upon which the accomplishment of the job in the standard time, in accordance with the standard methods, is dependent.

In scientific management shops, failure to accomplish a job in the time set indicates in a great majority of cases—except where green operators are concerned—that one or more of the conditions is not up to standard. Sometimes the trouble is so obvious as to make a minute investigation unnecessary; no matter how obscure, however, it may be located with certainty by checking up the operation, element by element, with a stop watch, and comparing the time taken with the time shown on the instruction card. Standard methods are of equal importance in the instruction of new operators whose troubles are often confined to one or two elements of an operation, or due to false moves not easy to detect in the absence of a standard.

Few people realize that the setting of a definite task, or standard of accomplishment based upon a standard method, and the payment of a high reward for its accomplishment, serve a more important end than a mere incentive for the operator. Were we to depend upon incentive alone, the results accomplished under scientific management would never be approached. Straight piece work of the ordinary type would seem to offer all that could be desired in the way of incentive, but repeatedly the production secured under the old style management with ordinary piece work has been doubled and trebled. The development of standards such as I have described and their maintenance does not lie within the power or control of the worker, nor even to any great extent within that of the foreman. The definite task and the high reward for its accomplishment are a power holding the management up to its job—obliging it to maintain standards. In February, 1915, Mr. C. B. Thompson published in the *Quarterly Journal of Economics* the results of an investigation of "Scientific Management in Practice." From this I quote as follows:

> If one may judge from rapid personal inspection of employes at work under the system, there can be no question of their closer application and deeper interest in the work they are doing. This interest extends beyond their own work to that of the management. Inasmuch as the success of the worker in earning the bonus depends partly on the smoothness with which the administrative department is conducted, the foremen and other executives receive numerous and forceful suggestions on this score if anything goes wrong. I have often seen workmen reminding their "bosses," in no uncertain terms, of their failure to live up to their managerial responsibilities. In fact, the authority of the operators within [illegible]eir own sphere is one of the outstanding peculiarities of a [illegible]cientific management plant.

Standard Products

The full benefits of scientific management are never realized until real co-operation between the Planning Department, the Sales Department, the Designing Department and the Accounting and Cost Departments has been established.

In machine work standardization may permit the use of commercial articles in place of special parts that otherwise would have to be manufactured in small quantities with universal equipment rather than special equipment. Draughtsmen if left to themselves will often in different parts of a machine use similar parts differing slightly in dimensions where the same size might have been made to serve—or even parts identical with those used in other machines might be used—with the result that such parts could be manufactured for stock in economical quantities and the expense for properly tooling up be justified. Parts may be so designed as to facilitate their manufacture with the equipment available and unnecessary work eliminated. In matters such as these co-operation between the route man and the time study or methods man and the draughtsman is invaluable. It is, however, in products sold chiefly through the retailers that we find the greatest need for standardization of product and particularly with respect to those of a more or less seasonal nature. In business of this class, encouraged by the buyers of the large distributors—both retailers and jobbers—or by competition, rival manufacturers vie with each other in presenting a wide and novel assortment of styles. In many cases a complete new line is presented each year or season, in others the line consists partly of new styles and partly of the old, and in the worst cases, of all former styles plus a generous assortment of new ones. Some of the styles may meet with large sales, some with less and some may not sell at all. The results of such practice are between the time of closing out the old line and receipt of orders for the new, work in the factory is slack, much of the plant lies idle and labor turnover is high. Owing to the uncertainty as to which styles will take with the buyers, there is considerable hesitation about manufacturing for stock, not only from fear of being caught with unpopular styles but because by so doing a shortage of raw materials required to fill orders for popular styles might be created. The situation is further complicated by the fact that many large customers demand "special put-ups," special labels, and special boxes which preclude manufacturing for stock.

Conditions such as I have briefly touched upon greatly complicate the problem of manufacture, multiply the work incident to planning and control, and make it almost impossible to keep the employes and the machinery uniformly busy. Fluctuations in th evolume of work do not seem to worry the management very much under the old style of management, especially where piece work is in vogue—particularly slack periods. Under scientific management it is quite a different story; workers must be kept supplied with work, and the cost of idle plant capacity is promptly and forcibly brought to the attention of the management as is the inefficiency and high costs of handling small orders and excessive variety.

The manufacturer, or at least the salesman and the designer, may deplore such conditions and regard them as being economically unsound, but he insists that the consumer—usually personified in the distributor's buyer—is responsible: to what extent this may be true is difficult to determine, but if the consumer knew what it costs him I'll wager that he would put up a howl for standardization that could not be mistaken or ignored.

In this direction schools of business administration such as the Harvard Graduate School of Business Administration, the Tuck School of Dartmouth, the School of Commerce and Accounts of the New York University, and no doubt many others with whose work I do not happen to be familiar, have helped, but the most significant thing I have seen is the work of Street and Finney, who call themselves advertisers, but who might better be called "Engineers of Distribution." They have established a department for the scientific investigation of problems of distribution such as I have touched upon, involving standardization of products, predetermination of the consumers' demand, etc. This work, which was started as an adjunct to their advertising work, ought to and will, I am confident, become of major importance. To the scientific management engineer such a service is an invaluable aid, to say nothing of its value to the manufacturer and the consumer.

Standards and Increased Production Essential to Betterment of Industrial Relations

In conclusion let me say that in presenting this paper I do not feel that I am adding anything to the art of management as it was developed by Taylor. My own experience has taught me that the work of Taylor and of those who had the great good fortune to be asociated with him through the period of his active and constructive work, as did Mr. Barth, Mr. Gantt and Mr. Merrick, was so fundamental in character and so thoroughly done as to leave little room for improvement; but much is to be done in its extension, in making it understood and in its application to new conditions and in new fields. The country has been flooded with weak imitations of the Taylor System masquerading as improvements under other names. This represents progress—backwards.

It is but natural that the members of the Taylor Society should be for progress, that they should desire to live up to its object as stated in its constitution—"to promote the science of management." There are two ways of doing this: by original contribution or improvement on that which exists, and by bringing about a better and more extensive understanding of that which exists and guarding against the loss of that which has been achieved. The former course is perhaps more alluring, but is it not apt to lead us into chasing rainbows or to reinventing, especially if undertaken before the second course has been pursued to a logical conclusion?

In our discussion of the broad questions of economics and of industrial relations, almost to the exclusion during the past few years of the practical problems of production and the technique of management, may we not have been indulging in intellectual joy riding and side stepping our real task?

I do not wish to detract from the importance of the sciences of economics and sociology, but I do want to point out that "indusrial relations" is, like "standards of accomplishment," but a single element in the science of management and largely dependent upon other factors of a more material and unromantic nature.

The happiest of "industrial relations" would be of no avail in the case of a Pennsylvania Railroad without a signal system, without running schedules for its trains, without the track-walkers' daily inspection. The tools ground by the workmen shown in Figure 7 (p. 500, October number) might reflect fine industrial relations but they will not turn out as much product as the standard tool.

Satisfactory "industrial relations," if they are to endure, must have something more solid as a foundation than sentiment or philanthropy. The most liberal plan for hearing and adjusting "grievances," for collective bargaining, "social service," and even "a voice in the management" carried to the extreme of a business owned and operated by the workers, leaves us still upon the threshold, with the same task before us, that of providing the ways and means. It matters not who selects the managing personnel—provided that they be wisely selected; it matters not who makes the studies leading to the establishment of standards, who makes the route sheets, who writes the instruction cards—providing they be qualified for the work and that it be well done. The important thing to the worker, the employer and the consumer is that these functions *be performed* and that they be recognized as essential to the attainment of the end sought by all.

That scientific management—with its scientifically determined standards replacing "opinion," and placing squarely upon the management and holding it up to responsibilities and duties either previously not realized or evaded, and providing the practical mechanism essential to real co-operation between management and workers—makes for sound industrial relations, removes the causes of suspicion and mutual distrust, and avoids "grievances," has been amply demonstrated.

Discussion

Carl G. Barth.[8] Objections have often been raised against the establishment of standards as a procedure that blocks the way for improvement; and under certain conditions, if matters are not properly understood or handled judiciously, legitimate improvements may be too long delayed. In this connection I venture to quote the following from my paper "Standardization of Machine Tools," read December, 1916, before the American Society of Mechanical Engineers.

> Before proceeding to any definite recommendations, it will be well to consider the objection so often raised to the adoption of standards of any kind—that standardization blocks the way for further development and improvement.
>
> If this were unqualifiedly true, standardization would almost be a crime; but if we adopt a standard merely as representative of the best a trade or profession knows of at any one time, with the understanding that as soon as a *decided* improvement is brought out, a new standard will be adopted to parallel temporarily, and eventually replace the former standard, the danger of stagnation will be obviated.

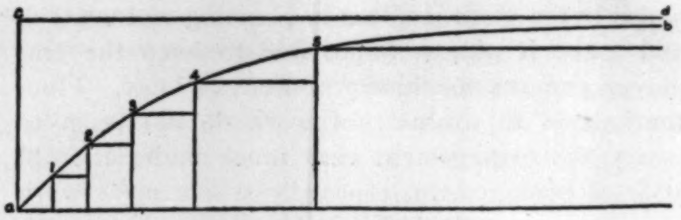


Figure 22

> Perhaps my idea will be understood more readily by reference to Figure 22, in which the smooth curve *ab* tending towards the asymptote *cd* represents a gradual development with immediate adoption of improvements in any line toward an eventual highest possible attainment; and the broken line whose corners 1, 2, 3, 4 and 5 lie in this curve the only occasional adoption of such improvements, when these have attained enough importance to make it worth while to change from one temporary standard to a new one, both standards then being in use during the period of change.
>
> Such a period will, to be sure, seem exceedingly inconvenient after we have once tasted of the fruits that the use of standards bring forth, but it will be as nothing compared with the troubles and expense of dealing with a lot of unstandardized equipment all the time. "Where ignorance is bliss, 'tis folly to be wise," surely does not hold good in these matters.

I also wish to say a word about the common misconception that a time study is necessary, or a good means, for ferreting out useless or wasteful motions, preliminary to standardizing a complex operation. Such motions are best ferreted out by common sense observation on the part of a person well versed in the trade, who has caught the right spirit, without any time study. The time study properly comes later, and may then be made by a person less expert in the trade; but no amount of mere time study of an unstandardized complex operation will directly lead to the elimination of its useless or wasteful motions. However, such time studies submitted to the scrutiny of a person well versed in the art may be that person's indirect method for detecting and eliminating useless and wasteful motions. Because of the misconception referred to, a lot of worthless time study is being made the country over by mere stop-watch men. Time study should not be taken up until conditions of machines, tools, materials and motions have all been properly studied in an every day, common sense and expert manner, and later standardized on the strength of the information thus gained.

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[8] New Haven, Conn.

Master Planks in the American Industrial Program[1]

Improvement of Living Standards; Increase of Output and Wages; Co-operation of Management and Workers in the Improvement of Methods; Stabilization of Employment

By WILFRED LEWIS
President Tabor Manufacturing Company, Philadelphia

Scientific management in the United States of America aims:

1. To raise living standards still higher by increasing the real income of all engaged in industry through progressive improvements and the cheapening of industrial processes;
2. To raise the high level of American wages still higher, with increases in output per worker;
3. To inspire both managers and workers to collaborate in order to improve the technique of production and distribution;
4. To keep men and machinery fully occupied.

I. The Gain in Real Income

In his latest message to the American Congress, President Calvin Coolidge remarked upon the "astonishing result of a reduction in the index price of commodities and an increase in the index rate of wages." Here has been the most direct of all additions to consumer buying power expressed in lower cost of production and increased capacity to consume the goods thus produced. The purchasing power of the average income in the United States in 1926 was forty-four per cent greater than in 1909, and thirty-six per cent greater than in 1921. This is based, of course, on the increasing output per worker. Between 1899 and 1904, the output per worker rose about five per cent; between 1904 and 1909, by about seven and one-half per cent. The depression of 1914 and the industrial dislocation which resulted from the war were such that the average output per worker in 1914 and 1919 was not greater than in 1909, although in that interval there had certainly been technical progress. Between 1919 and 1923 the output per worker in factories increased about twenty-four per cent and between 1923 and 1925 it increased again about eleven per cent. This is true of small plants as well as large; of those which are not engaged in mass production as well as those which are. President Coolidge accounts for our remarkable economic advance as coming chiefly through the elimination of industrial waste and the progressive gain in standards of efficiency.

The principles of scientific management and administration developed by Frederick W. Taylor and his disciples have at length grown to dominate the American industrial scene. The desire to reduce costs and to increase production, along with the conviction that scientific methods can be found which will make these things possible, are characteristic of the spirit of American management today. This spirit is as potent in the little business as in the big. Some of the smaller units are foremost in management methods.

Within the confines of its forty-eight states, lying between two oceans, the American nation has a trading area as great as all Europe, with no tariffs, no barriers to the freest exchange of commodities. In this continental customs union the huge aggregations of modern business and hosts of small enterprises have grown up, serving six score millions of buyers, and benefiting consumers as well as producers by the economies of scientific production and distribution.

With the growth of quantity production has come an increasing interest in quality. The American continental market is so diversified and exacting as to make quality increasingly important.

Another element, the financial element, has entered in. The annual savings of the United States now amount to about one-ninth of the national income, and the wise use of credit is fundamental to our social and economic development. The mining industry now employs more than ten thousand dollars in capital for every wage earner which it employs; manufacturing, more than five thousand dollars; the railroads, more than eight thousand dollars.

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[1] Paper presented at a meeting of the Taylor Society, New York, December 9, 1927. Also presented before the Third International Management Congress, Rome, September, 1927.

The policy of the American bankers has been increasingly responsive to the urgency of our great industries, and the stabilizing effect of the Federal Reserve System upon credit operations has been reinforced by a constant strengthening of the stream of scientific information by which sound credit policy is guided. Our bankers engage economists and engineers to advise them on industrial policies, and the best financial minds of America are now beginning to be intent on discovering, if possible, the right relations of finance to scientific production and distribution so that these may be regularized.

II. The High Level of American Wages

It has become increasingly plain that high wages are fundamental to American prosperity. Some economists have suggested that high wages are the strongest incentive to lower costs of production and distribution. But at the same time that the high payroll brings pressure to bear on the management to increase production and to decrease costs, it is also increasing the purchasing power of the consumers and sustaining or increasing the market for goods. For more than a generation real wages, that is, the amount of goods which wages can buy, have been higher in America than anywhere else in the world; in the period since 1921 they have jumped about thirty-six per cent. This has stimulated scientific management to still further savings, made effective through master controls and predetermined programs, bringing materials and men together at the right moment to permit the nicest precision of movement and a subdivision of work throughout standardized processes.

III. Willingness of Workers to Improve Technique

Scientific management in America has brought changes in technique and has forced rapid adoption of new industrial processes in a period of extraordinary developments; it has also encouraged a definitely co-operative attitude on the part of the workers. The point of view both of management and men has changed for the better. During the years 1916 to 1922, the number of employes directly involved at some time during each year in strikes and lockouts averaged more than 1,700,000; from 1923 to 1926 these figures showed progressive decreases, averaging 540,000; in 1925 only 330,000 men were thus involved—a fact extraordinary in a period of marked prosperity.

There are co-operative systems of workers and managers now installed on certain transcontinental railways. The workers hire their own consulting engineers; employers solicit suggestions for betterment from the employes, adopt them and share with them the resulting savings; and this movement to eliminate waste and to reduce costs is sponsored officially by the American labor unions. Mr. William Green, President of the American Federation of Labor, wrote in a recent article in the Manchester Guardian Commercial, "Holding that only through increased productivity can higher standards of living be maintained, and that all groups, therefore, have a mutual interest in increasing the efficiency and hence the productivity of industries, our trade unions recognize the interdependence of management and wage earners, though their interests may not be necessarily identical."

IV. The Effort to Keep Men and Machines Fully Occupied

Since growth and change are the outstanding characteristics of American industrial conditions, a result is that more attention must constantly be paid to the task of keeping men and machines fully employed. Our immigration has been restricted, and our population has increased since 1919 by only two per cent a year, yet 8,380,000 workers produced in 1925 an output one-quarter greater than 9,000,000 workers in 1919. There has been a reduction in the number of persons engaged in agriculture, in manufactures and in transportation since 1919, yet output has greatly increased in every one of these fields. Most of this increase has come about since the depression of 1920-21. In spite of this extraordinary fact little if any unemployment has resulted. The astonishing growth of the services connected with the distribution of goods, the professional and personal services, and the new activities called into being by the automobile, have apparently absorbed those who in other circumstances would have gone into industrial production or else would have been idle. Close to a million persons must now be employed, outside of automobile factories, in work connected with operating or keeping in operation the more than twenty million automobiles and motor trucks in the United States. The building of highways has absorbed others. In the period from 1920 to 1926 the consumption of rayon mounted from less than 12,000,000 to more than 75,000,000 pounds; sales of radio goods rose from practically nothing to almost $500,000,000; in 1926 more than a million washing machines and nearly a million and a half vacuum cleaners were sold. And at the same time that these industries were growing they were stimulating all those dependent upon them and were thus creating a constantly widening circle of profitable employment.

To take a single example, the automobile industry in 1926 consumed approximately fourteen per cent of all finished iron and steel products, and stimulated the iron and steel industry and its branches.

With the rapid development of new industries and the stimulation of the old, the American manager is forced to keep machinery employed or to scrap it; to keep men employed or to lose them to a better manager who will keep them employed. New types of machinery may be gradually introduced at a rate no more rapid than that of the normal labor turnover. Employers are ingenious in working out methods of training workmen to use new machines, so that the labor force may be kept intact. Our practice is far from perfect in these respects, yet its tendencies are plain and there is growing appreciation of the fact that industry must be stabilized, that employment must be secure if prosperity is to be maintained.

It is because we have made real progress in these directions; it is because we feel as employers, as employes, as consumers, as bankers, as economists or as engineers that we are learning to collaborate more effectively every day;—it is for these reasons that we in America look forward hopefully to the future.

(The discussion of this paper will appear in a subsequent number)

News of the Sections

Central New York

On October 27, the group was addressed in Syracuse by Mr. A. B. Segur, Industrial Engineer of Oak Park, Ill., and writer for *Industrial Management* and other management periodicals, on the "The Ideal of Industry." As illustrative material a film showing micromotion studies of actual factory operations was given and a practical demonstration of the transference of skill through the use of motion studies was made with the audience as subjects.

The November and December meetings were combined on December 2, when Mr. Morton J. Baum, Assistant Secretary and Merchandise Manager for the Hickey-Freeman Company of Rochester, N. Y., told "How the Hickey-Freeman Budget Works."

New York Metropolitan

The opening meeting of the Metropolitan Section was held on October 14, at the Town Hall Club. Mr. Meyer Bloomfield, Consultant in Industrial Relations, who has been engaged in making a survey of New England industries, gave examples of what is being done through research and planning toward the stabilization of industrial conditions in New England. Mr. Wesley Mitchell discussed the paper from the point of view of the future of industry in New England.

At the meeting on November 17, at the Fraternity Clubs, Paul Kellogg, editor of the *Survey*, gave a delightful address on the need of a common ground of understanding in our present day industrial world. John Fitch, Spencer Miller, H. S. Person, John H. Williams and others contributed interesting discussion from their many points of view.

New York Southern Tier

Mr. H. O. Baldwin of Babson Institute was the speaker in Elmira on October 10. His subject "The Value of Forecasting in Making General Production Plans" proved of great interest to the group.

On November 14, Mr. Frank B. Mullin, Production Manager of the Willys-Morrow Company, Elmira, N. Y., gave a practical talk out of his own valuable experience.

The December meeting on the twelfth was held jointly with the Industrial Relations Association. Professor F. M. Edson spoke on "The Relation between Education and Industry."

Reviews

Harvard Business Reports, Vols. 1, 2, 3 and 4. Compiled by and published for the Graduate School of Business Administration, Harvard University, A. W. Shaw Company, Chicago, Vol. 1, 1925, Vol. 2, 1926, Vol. 3 and 4, 1927.

For decades elementary and secondary school education has been alive with experiment and change, and collegiate institutions have at least developed considerable talk about revitalizing instruction, but the squeaky coach of graduate teaching in the social sciences would be considered as having hardly budged at all were it not for one notable innovation. This is the displacement of the lecture method by the case system—an advance, as President Butler recently characterized it, from an almost exclusively expository and didactic method, through which the major portion of the thinking is done by the teachers themselves, to a process of conference, requiring some mental excitation on the part of the students as well. It was the Harvard Law School, through the introduction and application of this method by Prof. Langdell in his classes in the 70's, which was the pioneer in a change that has revolutionized the teaching of law everywhere; it is Harvard again, through the Graduate School of Business, under the able leadership of Dean Wallace B. Donham, which has made the most effective application of the case system to business teaching, and by its active work in developing the case material has made possible the rapid extension of the newer method to the chief institutions of the country.

Case teaching has as its main aim the development of mental power, through the requirement of analysis, synthesis and an actual decision in a concrete case. If it is not an aid to the quick acquisition of facts or to the acquiring of a broad field of knowledge in a limited length of time, it is likely to heighten the impression and the usability of the facts which are acquired. There is no question that its development has been the most significant influence upon the field of graduate teaching. The country owes a debt of gratitude to Harvard both for demonstrating the value of the new system through successful application and for the technical excellence of the case material it has generously made available to other institutions during the past seven years.

The first case books produced by the Harvard staff were not collections of business problems in general but classified instances of obstacles presenting themselves to executives. Illustrative of these are Copeland's "Marketing Problems," Lincoln's "Problems in Business Finance," Tosdal's "Problems in Sales Management," etc. — books which had the merit of looking like other text books and of including material limited to a specific field. Lately, however, some of the effort of the Harvard staff has gone into the production of books of problems, like Volume 1 and 2 of the books being reviewed, that are miscellaneous in nature and are grouped under the general classification "business." In all four volumes, effort seems to have been made to simulate the appearance of the uninviting tomes in the Harvard law library. Like them, the new business books are bound in buckram and stamped in crimson, black and gold; they are bulky and technical and they are expensive; to make the similarity greater they are called "Harvard Business Reports," Vol. 1, Vol. 2, etc.: the citations to volume and page number are made in a fashion similar to references in the U. S. Supreme Court Reports. It is proposed to bring out a great many volumes of this sort in the future, at least two a year, and if the buckram and red are to be retained, it will be difficult, without closer scrutiny, to tell a business executive's office from a lawyer's.

Volume 1, published in 1925, contained cases without commentaries. This was a serious omission which volumes 2, 3 and 4 quickly remedied. The note of comment or analysis is comparable to a decision by an instructor or business executive. Volume 3 is largely concerned with problems of marketing and Volume 4 with labor problems. Each report presents an actual situation which has arisen in business, with the name of the concern disguised where so requested. The cases are drawn from every field of business practice — organization, finance, accounting, marketing, advertising and personnel. The pertinent facts, the issues involved, the alternatives presented, the decisions taken, the results obtained, and a commentary and analysis by an impartial authority—these combine to make each report the record of vital administrative experience.

Because of the magnitude of this undertaking, which is still in its beginnings, suggestions and criticisms are in order. It is in a spirit of fullest co-operation with the Harvard bureau that two points are raised which may be worth its consideration. One involves the present form of the case books, the other the spirit.

The purposes of these volumes are two: one is to provide the tools for teaching by the case method; the other, and more ambitious, is to provide a library of reference to which the busy practitioner himself, the sales manager, production man or investment officer, may go whenever he has a knotty problem, just as the lawyer consults his cases whenever in doubt about a point of law.

For both purposes it seems to the present writer that the form of the earlier problem books, mentioned above, on special aspects of business, is much to be preferred, and that little, if anything, is to be gained by the ponderous appearance of the present volumes. Assembly of miscellaneous cases in a volume labelled only "business" seems especially undesirable. In teaching there is every advantage in being able to assign a definite text book limited to a special field; while as far as the great mass of practicing executives is concerned, we feel certain that a far greater distribution and use of the excellent case material would be assured by bringing out such books in sizeable and less expensive volumes dealing with the special kind of business problems in which the individual is interested. For while it is true that most managerial problems are interrelated, the average business man is, in fact, an accountant, a salesman, an advertising man, an investment officer, etc., and reads only specialized books.

We wonder, too, how many executives there are, (or, during our life time, there will be), who when confronted with a problem will go to the library to look up the mass of general precedents. The untrained man would find them forbidding; the university trained business school graduate already has the principles in mind and is not likely to bother. Unlike the situation in the law, business books are sure to become out of date faster than the decisions of our tribunals, as the latter grow the more hoary with age, while business men look askance at the experience of a bygone age. On our part, we should very much prefer to see the problems presented in case books limited to special fields. Miscellaneous cases might just as well be held until grouping becomes easy, or printed in individual sheets and pamphlets, for use in places where the bulky tomes would be an obstacle.

The second of our suggestions relates to the spirit of these case books. The basis of our comment is probably subjective and may be irrelevant. It seems as if the similarity to law books is almost too close, for law books are too much concerned with legal technicalities and the description of things as they are. Most lawyers go to law books not to seek justice or to vindicate principles but to win cases. If the older method of lecture and assigned reading formerly so generally in vogue in schools of business had defects, it also had a great advantage in this: The teacher's point of view was likely to be that of a social economist rather than a technician, he was not intent on immediate results alone and he assigned readings likely to call the students' attention to stimulating questions as to the why and the wherefore of industry in the social process. The present Harvard case books, except in Volume 4, which has the beginnings of something different, seem to be concerned almost exclusively with the policies and methods that make men efficient in producing at a profit in their particular concerns. They tend to make men effective, but not necessarily in the highest social sense. Perhaps, as many economists believe, it is better that men seek only their own interests. But if it is good occasionally to be jolted out of our acceptance of the business system as it is, and to have our attention distracted from technical matters of production, sales and finance, we should like to see some cases which raise disturbing moral problems of social justice; which ask the executive what kind of society industry is fashioning and which make him reconsider what all this activity of business is about. We assume the last is remedied through the influence of the teacher in classroom discussion or perhaps through the assigned readings. But as these books are intended for the practicing executives as well, we should be cheered to have the Harvard group take us into its confidence that it does regard some of the strut of business with less solemnity by including in future volumes an occasional indiscretion showing that they too are sometimes affected by a divine discontent and questioning.

Herman Feldman

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[1] Assistant Professor of Industrial Relations, Amos Tuck School of Administration and Finance, Dartmouth College.

Accounting Systems. By Geo. E. Bennett, LL. M., C. P. A., A. W. Shaw Company, Chicago, 1926, pages xiv, 554.

Unfortunately, the word "System" has come to be looked upon by many executives, to say nothing of employes, as a polite way of saying "Red Tape."

Probably the reason for such a biased impression is due to the common error of endeavoring to make the business fit the system installed, instead of making the system fit the business.

Mr. Bennett in his book on "Accounting Systems" splendidly points out this fact in his introductory chapter by showing the result that might be expected if one should attempt to transfer bodily the accounting system of a large city department store to a country drygoods store.

Not only is it true that such an error is an inexcusable one, but it is also equally unpardonable to attempt to adapt, without careful analysis, the books and records of one business to another, even though both businesses are engaged in activities of a similar nature.

This leads to the question "What actually justifies a system's existence?" Unfortunately, Mr. Bennett has stated under the subtitle "Justification for a System's Existence," that because the cost of operating the system must come out of the company's profits, unless such expense earns a profit, there is no good reason for its being incurred.

How then can we reconcile ourselves to providing an accounting system for a new enterprise where it is impossible to predetermine profits? Or what about the many organizations that are operated for purposes other than profit making?

We should be on our guard here not to take the author's statement literally, but to read into this statement an intention to imply that there should be some direct relationship between the cost of operating an accounting system and the resulting addition to profits.

The real justification for a system's existence is whether or not it reflects the operations of the business in such a manner that it presents the proper facts necessary for executive control when they are "current news" and not "past history."

Mr. Bennett has with great clarity set forth as examples the methods employed in many enterprises of different natures and has given concise discussions of the standard books and forms that are used in the various departments of a business. But here the actual helpfulness of his book ceases.

It is one thing to know what books or forms are used in these departmental activities, but it is another matter to secure an understanding of the circumstances that give occasion for the use of these forms.

In order to have made his splendid work infinitely more valuable the author could well have added a section that would clarify the principles involved from the very beginning of an investigation of the business activities to the actual installation of the books of record. True, Mr. Bennett has splendidly set forth the necessity of keeping in touch with the system after actual installation has taken place, and the necessary education of employes to the point where they are handling factors involved properly. But there is a further side to the story. Many times in the actual construction of a record the form would be differently compiled if a technically trained employe were to operate it or one not so skilled.

There is the effect of seasonal businesses to be considered. Forms requiring but one person to operate them during a dull period may require many more during the busiest season. This may mean subdivision of records, etc., in order to secure a division of labor.

There is the question of the determination of the proper period of examination of existing records in order to secure the necessary data for new construction.

There is the consideration of the demands of the management for special information and its possible effects upon account classification and consequently the columniation of records.

There is the possible effect of peculiar conditions of the particular business, such as the necessity of weekly Income, Profit and Loss statements, various special analyses, etc.

These are some of the "great principles" of system structure, for the remainder of the work is merely adapting the standard forms and records, so completely explained by the author, after revising them to meet the situation as clarified through the answers to these questions.

If the author had included these factors that warrant the use of the particular methods he describes, there would have resulted a manual indispensable to the profession.

George J. Geier[2]

The New Leadership in Industry. By Sam A. Lewisohn, E. P. Dutton & Co., New York, 1926, pages x, 229.

A book that is notable for its sound common sense and constructive sanity is Sam A. Lewisohn's "The New Leadership in Industry." Written by a man of practical managerial experience, it has the atmosphere of realism that is characteristic of the work of those who deal with familiar things. At the same time, it has a rare objectivity that enables the author to speak of the shortcomings of management frankly and without bias. In addition to these two excellent qualities, the style is clear, direct, and free from pedantic obscurities.

The author's principal thesis is that industry, as distinct from agriculture and other pursuits, is coming to play an increasingly important role in modern life, that management, regardless of ownership, is the most important factor in industry, and that, consequently, it is of utmost concern to society at large that management should be intelligent and enlightened. The purpose of industry, Mr. Lewisohn asserts, is to produce goods and contribute to human well-being. There rests upon management, therefore, a threefold responsibility: for development of the industry as such, for the well-being of the employes, and a social responsibility to the community at large. The extent of the latter depends upon the existing circumstances. In a large community of diverse interests an executive of an industrial enterprise may have no more responsibilities than any other good citizen, but in an isolated industrial community the comfort of all the inhabitants depends more or less directly on the intelligence and good will of the resident manager.

Few would be inclined to question the justice of Mr. Lewisohn's claims as to the importance of management. His practical suggestions as to sound managerial policy are, therefore, the more interesting and worthy of consideration. Of outstanding importance are his chapters on employe representation and trade unionism, though perhaps the most significant single chapter is the one on "The Modern Employer's Wage Policies." One gathers that Mr. Lewisohn recognizes the right of labor to organize and despises the cruder methods of opposing trade unionism, but believes that employe representation under a management of intelligence and good will is the best arrangement. He rejects the idea that there can ever be complete democracy in industry and contends, soundly enough, that most wage earners do not want a controlling voice in management.

The book is so essentially constructive and sound that one hesitates to criticise. One or two points where differences of opinion are possible may be mentioned, however. It is not surprising that Mr. Lewisohn should defend the capitalist system, and he does so in gentle and reasonable terms. Even so, he claims too much for it when he implies that none of its evils are peculiar to it and would be present under any system.

Mr. Lewisohn himself would be the last to claim that he has made a complete statement of the purposes and methods either of trade unionism or of employe representation. His book is not a treatise on either subject. However, as a consequence, there is some danger that the uninformed reader may obtain some impressions that further inquiry will not confirm.

The author's criticism of the use that has been made of the theory of the living wage is basically sound, but it is not likely that he would wish to be taken with absolute literalness at this point. Should national income be a basis for determining what can be paid in a particular case in view of the absence of national uniformity either of prices or profits? And since management represents the key to so much that is desirable, may it not be just as well that a stimulus be offered occasionally in the form of a wage demand that would require greater managerial efficiency if it is to be met?

However that may be, Mr. Lewisohn has written a book that ought to be read by every manager for its constructive suggestions and by every intelligent citizen for its revealing light on some of the problems of industry.

John Fitch[3]

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[2] Instructor in Accounting, New York University, and member of accounting firm of Whiteman, Geier & Co.

[3] Department of Industry, New York School of Social Work.

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The sublimest duty of the engineer is to keep the faith:

The faith of the client that he will not undertake what he knows to be beyond his ability; and that with respect to what he undertakes he will give conscientious service to the limit of his ability;

The faith of his fellow engineers that he will remain true to his science and will magnify and not cheapen it; and that he will base his efforts for public recognition upon ability, scientific attainment and actual performance, and not upon ambiguous self-laudation;

The faith of the community that he will undertake no service inconsistent with the public welfare and that in service consistent with the public welfare, but in which the interests of groups appear to come in conflict, he will judge carefully and sympathetically the claims of rival interests, and attempt to establish that unity of purpose which promotes the public welfare.

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